DOCUMENT RESUME

ED 025 530 24 TE 499 967

By-Gould, A. Oren
Developing Specialized Programs for Singing in the Elementary School. Final Report.
Spons Agency-Office of Education (DHEW), Washington, D.C. Bureau of Research.
Bureau No-BR-5-0241
Pub Date Aug 68
Contract-OEC-6-10-016
Note-106p.
EDRS Price MF-$0.50 HC-$5.40
Descriptors-Case Studies (Education), Choral Music, Educational Research, *Elementary Education, Elementary School Students, Instructional Improvement, Instructional Materials, Music, Music Activities, *Music Education, Music Techniques, Pilot Projects, *Remedial Instruction, Remedial Programs, *Singing, Surveys, *Teaching Techniques, Vocal Music

The objectives of this research into ways of helping children who have difficulty finding and using their singing voices were (1) to make an intensive study of singing difficulties of elementary-school children, (2) to discover, observe, and analyze successful techniques and materials for use with children who have not learned to "carry a tune," (3) to develop a sequential remedial program for problem singers, and (4) to test the program in classrooms. Methods included a nationwide survey of singing problems among elementary-school children and the testing of corrective techniques and materials in the Western Illinois University Laboratory School and in selected public schools. Results established the importance of kinesthetic factors in discovering and developing the singing voice: the child must identify his singing voice as opposed to his speaking voice, and he must learn the sound and feeling of his voice as it matches pitches that he hears. (The appendices include copies of the survey questions, of a test of singing ability, and of specific corrective materials used in the study.) (JS)

BR 5-0241
PA-24

FINAL REPORT

Project No. 5-0241
Contract No. OE6-10-016

DEVELOPING SPECIALIZED PROGRAMS FOR SINGING IN THE ELEMENTARY SCHOOL

August 1968

ED025530

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education
Bureau of Research

TE 499967

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

FINAL REPORT
Project No. 5-0241
Contract No. OE6-10-016

DEVELOPING SPECIALIZED PROGRAMS FOR SINGING IN THE ELEMENTARY SCHOOL

A. Oren Gould, Ed. D.
Western Illinois University
Macomb, Illinois

August 1968

The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Office of Education
Bureau of Research

ACKNOWLEDGEMENTS

During the three year period of this study an ever widening involvement with people has occurred. In the beginning the primary concern of the project was with the singing problems of elementary school children. Eventually students of all ages through graduate school and even some adults were involved. The project came to include persons in inner cities and in suburbs -- in small towns and rural areas -- people of many races and social and economic situations.

Many teachers have been involved. In the beginning the project staff expected to work mainly with elementary music specialists -- college music methods teachers and school music supervisors and teachers. As the study unfolded, however, the ever increasing spiral of interest soon reached specialists in music and music education research, choral directors, and private voice teachers. Most important of all was the participation of classroom teachers in many of the research activities.

To name every person involved in the project would be impossible. A section of the appendix at the end of this report contains a list of the complete project staff and the names of teachers and administrators in cooperating schools who assisted with the project. All of these people and more than 300 elementary school children, college students, and adults provided both help and encouragement.

The project director wishes to acknowledge in this section of the report a special debt to the participating students in the elementary schools in Virginia Beach, Virginia; Cleveland, Ohio; Geneseo, Illinois; Grand Rapids, Michigan; Macomb, Illinois; Oakland, California; Princeton, Illinois and Quincy, Illinois; also to the freshman non-major music students in San Diego State College, San Diego, California and to persons of various ages at Ricks College, Rexburg, Idaho. A very special note of thanks is directed to the elementary pupils of the Western Illinois University Laboratory School for their untiring efforts during both the pilot study phase and the final phase of the study.

The cooperation of administrators in all of the participating schools is noted here. Their names will be found in the appendix of this report. Special mention should be made of the assistance of H. Waldo Horrabin and L. Donald Hahn, Principal and Curriculum Coordinator of the Western Laboratory School; of the encouragement of Frederick P. Abel and Clifford A. Julstrom, Dean of the School of Education and Music Department Chairman of Western Illinois University; and of the guidance and interest of the Research Council of Western Illinois University, Research Treasurer Herman R. Koester, President A. L. Knoblauch and Dean of Administration Richard D. Gibb.

Project consultants who proved especially helpful included: Hazel Morgan, Claremont, California Graduate School; John Sheldon, San Diego State College; Edna Hehn, Oakland, California Elementary Schools; Dorothea Blyler, Wayne Wiggins and Forrest Wanninger of Western Illinois University, Richard Colwell, Robert B. Smith and Charles Leonhard of the University of Illinois.

Finally the director is most grateful to his project assistants: Mrs. Judith Wright who, while advancing from graduate student to the rank of instructor, did most of the actual teaching during the pilot study phase and directed the Western Laboratory School experimental project during the final phase of the study; Mrs. Dorothea Winter, whose organizational and secretarial skills were a major contribution.

CONTENTS

PAGE

Acknowledgements III

Index of Tables VI

Introduction 1

Method 8

Results 19

Conclusions and Recommendations 48

Summary 55

References 62

Bibliography 64

Appendix A . . . . A 1

Appendix B . . . . B 1

Appendix C . . . . C 1

FINDING AND LEARNING TO USE THE SINGING VOICE
A Manual for Teachers . . . . Insert

INDEX OF TABLES

TABLE		PAGE
I	Make Up of the Pilot Study Groups in the Western Illinois University Laboratory School	12
II	Make Up and Location of Experimental and Control Classrooms - Phase III	16
III	City Population and Ethnic Groups Represented in Experimental and Control Groups	17
IV	Percentages of the Incidence of Problem Singers (Children Who Can't Carry a Tune) Continuing Through the Year	19
V	Pre-Test and Post-Test Mean Raw Scores and Standard Deviations for the Experimental and Control Groups - Phase II	22
VI	Mean Gain Scores of the Experimental and Control Groups - Phase II	23
VII	Children Scoring Below the Cut-Off on the Pre-Test and Post-Test - Phase II	23
VIII	Before and After Data of the Sheldon Study - Phase II	34
IX	Reliability Coefficients for the Gould Test - Phase II	37
X	Validity Coefficients for the Gould Test Obtained from Judge's Scores - Phase II	37
XI	Pre-Test and Post-Test Mean Raw Scores and Standard Deviations for Public School Experimental and Control Groups	38
XII	Pre-Test and Post-Test Mean Raw Scores for Children Scoring 208 or Below on the Pre-Test in Public School Experimental and Control Groups	39
XIII	Pre-Test and Post-Test Mean Raw Scores and Standard Deviations of the Western and San Diego Experimental Groups - Phase III	40
XIV	Mean Gain Scores of the Experimental and Control Groups of the Public School Experiments - Phase III	42
XV	Validity Coefficients for the Gould Test Obtained From Judge's Scores - Phase III	42

INTRODUCTION

This is the final report of a three year project which studied the singing problems of elementary school children and developed ways of helping children find and learn to use their singing voices. The introduction presents the purposes, problems and rationale of the study. The chapters which follow describe the methods used, results obtained, and give the conclusions and recommendations of the project. An insert in the bound copies of this report is the separately bound manual for teachers, one of the major outcomes of the study. Appendix A lists the complete research staff personnel and the names of cooperating schools, teachers, administrators and specialists in research in music education. Appendix B reproduces the survey questionnaire used in the study and the Gould Speech and Song Response Test, a tape recorded test developed especially for the project hereafter referred to in this document as the Gould Test. Appendix C lists and describes speech and song materials of the project.

The central purpose of the project as stated above, was to develop ways to help elementary school children find and learn to use their singing voices. In structuring a sequential program of research activities the following objectives were arrived at before the project began:

1. To make a thorough study of the problems elementary school children encounter in finding and learning to use their singing voices.
2. To observe and evaluate classroom and individual remedial techniques and materials presently being used to help these children.
3. After the study of current practices, to develop and test with pilot studies in a laboratory school remedial sequences of procedures and materials.

4. To test remedial sequences found successful in the pilot studies in classrooom experiments in the public schools.
5. To promote the adoption by teachers of singing, particularly those responsible for elementary music experiences, successful techniques and materials for helping children find and learn to use their singing voices.

To achieve these objectives the following specific problems determined the structure of the project:

1. To determine the reasons why some school children do not learn to carry a tune and to have staisfactory experiences with singing activities. (The study was limited to normal children in the belief that physical and emotional reasons for non-singing should be examined in later studies.)
2. To identify the factors of success by observing teachers of singing in action who were actually making successful singers out of children who couldn't sing.
3. To evaluate successful factors and use them in developing remedial sequences which could and would be widely used.
4. To provide for adaptability of the remedial sequences to a wide variety of materials and to persons of varying age levels.

The following discussion is an analysis of these four problem areas:

1. The child who does not learn to carry a tune.

   Some children find and learn to use their singing voices at a very early age. Others take a bit longer but are usually singing well by the end of the first or second grade. For these children, who for convenience might be called average or above average singers, it is perhaps enough to develop habits of careful listening by providing experiences in singing and listening. Tuneful singing and maturing go hand in hand from kindergarten on for the beginning singer.[1]

But what about the child whose early experiences in using his singing voice are unsuccessful -- the child who experiences difficulty and delay in learning to match pitches and carry a melody with his voice? Those who have worked extensively with growing children in their singing activities know that there are some of these in every school and in every community. Their collective problems have represented one of the unsolved problems in music education.

Concern for this unsolved problem by educators dates back at least to 1932 when the classic study by Jersild and Beinstock[2] was made. Yet in 1961 when Pauline Geiser and Westervelt Romaine made their studies of children's singing problems[3] the 18% incidences of non-singing in the elementary schools they found were almost identical to that reported in the earlier study -- this in spite of numerous research studies of the problem made in the years in between.[4] Either effective means of helping these children had not actually been found or research findings had not been assimilated to any great degree into teaching practice. Perhaps it would be fair to assume that both factors contributed to the neglect of this forgotten group -- the children whose efforts to sing were unsuccessful.

Typically the child who fails to take this important first step in musical learning -- finding and using his singing voice -- experiences increasing exclusion and alienation from music as he grows older. A speaker at a music education conference recently quoted the figure of 10% as the national percentage of the secondary school population involved in some kind of school music instruction. If this is accurate, it is small wonder that this situation exists if exclusion from successful musical experience begins in the primary grades. It is small wonder that a large segment of our adult population rejects all music above the level of folk music as long as school music programs function for a group that is increasingly becoming a minority.

Typically music education books and teacher's manuals which treat singing experiences in the elementary schools discuss two kinds of problem singers[5] -- the child who "can't sing" and the "child who doesn't want to sing". Much has been written about breaking down psychological inhibitions against singing which children have or acquire in early childhood. Suffice it to say that the child who experiences failure in his early attempts to sing soon develops fears and antagonisms toward singing and music which may last a lifetime. Members of the project staff who teach college level non-major music classes for future teachers have made it a practice to question persons in these classes who can't sing. All too often it has been found that it was a teacher, usually a music specialist who, by actions or words, convinced them that they couldn't "carry a tune in a basket".

2. Identifying factors of success.

It was recognized that some experienced teachers were claiming success in helping children find their singing voices. The project director, himself, had experimented with kindergarten and primary age children enough to be convinced that all unhandicapped children could be helped and that early childhood was the most favorable time for this help. It seemed obvious that an immediate problem of the study was to identify the factors of success in terms of procedures and materials used by teachers in the context of their relationship to the problems encountered by children in learning to sing.

Could the causes of difficulties in perceiving tones, in remembering melodies and in correlating the vocal mechanism with them be identified? Could some guiding principles for helping all children be found? Could these be related to procedures and materials?

3. Evaluation and use of factors of success.

Two sub-problems emerged as this problem was considered. There would seem to be little point in determining how to best bring about success with singing experiences unless somehow these findings could find their way into the classroom. The question was asked, "How many of the voluminous research reports and masters and doctoral dissertations in music education have really made any difference in the classrooms?"

In answering this question attention was directed to a few instances where research had actually made a difference. In these teachers had been involved. In these students had participated in a natural learning routine. The solution to the problem of use, then, must be found by first directing the attention of music teachers to fresh consideration of children's singing problems, then involving them in the process of carrying out the investigation of these problems. This conviction led to another consideration: In many elementary schools classroom teachers carry the major responsibility for the actual teaching and directing of their pupil's music experiences. It would seem logical to involve both elementary classroom teachers out in the field and college students in training for future positions as classroom teachers in activities of the project.

4. Adaptation of factors of success to varying age levels and to varied materials.

To develop a remedial sequence consisting of one prescribed set of song materials would seem to contribute to the difficulty in bringing about wide use of successful remedial factors. In order for any given classroom to achieve the desired results a set of these materials must be obtained. They must be used to the exclusion of other materials which might normally be used. The emergence of at least five or six new published series of elementary music texts on the market, to say nothing of the supplementary materials -- Orff and Kodaly - Richards, etc. --

seemed to emphasize the impracticality of this. Furthermore, any specific prescribed song or melodic activity might prove to be very effective at one age level and of no value at another. The solution seemed to lie in conducting the research with a variety of materials and at several grade levels from the very beginning. The focus would be on discovering basic principles and developing a sequential process. Materials used would be considered prototypes and would be determined by the patterns emerging as the study progressed.

METHOD

The project was divided into three phases of one year each. Although the project design - survey, pilot studies, experimentation - was determined by objectives and problems, the actual structuring of the research program for the second and third phases was dependent on results obtained from the first phase.

1. Phase I - Orientation to the Problem

The first phase from July, 1965 to June, 1966 began with a survey of problems and practices of the study. Questionnaires were sent to 1500 music teachers whose names were determined by information supplied by the Music Educators National Conference. Each person receiving the survey was selected because of his connection with elementary music. Included were special music teachers and supervisors in elementary schools, directors of music, college music methods teachers, and music educators who had some special interest in childhood music education. A few classroom teachers known to work effectively with children's music experiences were included, as were some specialists in educational research who had worked or were working with some aspect of the problem such as pitch perception, tonal memory, etc. Private voice teachers were not included in the original survey but responded or requested questionnaire forms as they received word from others.

The total number of replies received was 602 which may seem a low percentage -- less than 50%. But those who did reply were persons who were really interested in the problem of the study. The replies represented all fifty states, Canada, South America, Australia, New Zealand, British Isles, France, Hungary, Lebanon, Israel, and Ethiopia. These replies not only provided many insights needed for structuring the remainder of the study but provided names of possible participating schools, teachers, and cooperative researchers needed for the observation and experimental activities which were to follow.

As the list of participants was developed all ideas of attempting to randomize in terms of school size, location or other criteria were abondoned for both observation and participation research activities. It was reasoned that the criteria of interest and success in solving the problems of the project must take precedence. At the same time, it was obvious that participating schools could be selected so that various learning situations would be represented.

At this point consultations and observations of teachers and pupil's singing experiences in elementary music classes were begun. The project director first visited classrooms where he had first hand knowledge of successful help with children's singing difficulties. With the help of information from the survey and leads from a multitude of sources, consultations were made and singing experiences were observed in class levels from nursery school through the sixth grade in inner city schools, suburbs, large towns, small towns, and rural areas from coast to coast. As has been stated, the criteria used in selecting schools for consultation and/or observation were, first of all, interest and success in solving the central problem of the project. Secondary considerations were geographic and those relating to obtaining insights into the singing problems of a true cross section of elementary children in the United States -- factors such as race, economic and social environment, school size, class size, and type of music teaching (specialist or specialist with classroom teacher).

Between conferences and observations during Phase I the Gould Speech and Song Response Test[6] was developed to provide a means of evaluating progress during the pilot study and classroom experiment phases of the project. Initially it was proposed that the test be constructed to provide a diagnostic tool for pinpointing specific singing difficulties such as lack of tonal memory, lack of ability to discriminate pitches, low speaking voice, etc. It soon became evident that the kind of diagnostic test needed was a measure of how much the child could sing. Every child observed was singing to some extent, and all problem singers were experiencing several, if not most, of the singing difficulties to some extent. Testing then became more of a measurement of degree although the sectioning by concepts and skills of the aural and vocal vocabulary were retained. Retained also until Phase III was the audiometer test for hearing loss and for perception of various ranges of tones.

During Phase I test items were tried out with 3rd, 4th, and 5th grade students in the Western Illinois University Laboratory School. Primary grades and kindergarten were avoided because of the plan to use these children in Phases II and III, but test items were tried out informally on other children at these age levels with whom the project staff had contact. Some item analysis and much experimental structuring resulted in the test reaching its final form by the beginning of Phase II.

2. Phase II - Pilot Studies and Case Studies

As the experimental phases of the study began the project staff recognized the need for developing statistical proof of the validity and reliability of results obtained. At the same time they were aware of the greater value of personal day by day, week by week observations of individual "live" children in terms of obtaining practical information for classroom use. It was recognized also that it was extremely important that learning situations be as natural and normal as possible -- as nearly devoid as possible of the usual artificial classroom research attitude. For statistical results it was planned to correlate pre-test and post-test scores of the pilot studies with the scores obtained from a panel of judges who would rate before and after tape recordings of songs sung by children of experimental and control groups.

Pilot studies were initiated in September of 1966 in the two sections of grades 1, 2 and 3 in the Western Illinois University Laboratory School. (It was decided not to experiment with kindergarten children so that all were free to find their singing voices during a year which the project staff regarded as most crucial in the singing experiences of all children.)

An experimental class and a control class were organized at each grade level. Except in grade 1 these were made as equal as possible in singing ability at the beginning of the year by placing children in each group so that pre-test raw score means on the Gould Test were within one point. Composite mean scores on an experimental primary version of the Gordon Aptitude Profile[7] were used for further equalizing the groups. In grade 3 they were matched within 2 points (these differences were not statistically significant). Equal numbers of problem singers and the same proportion of girls and boys were placed in experimental and control groups. As the year progressed because of children moving away from the community the experimental and control groups were thrown out of balance. Thus at the end of the study, for statistical calculations, it became necessary to equalize the groups by eliminating certain pupils from one or both experimental and control groups until mean raw scores on the Gould Test were again matched.

In grade 1 the classes to be used as experimental and control groups had been matched in terms of IQ, achievement, and chronological age for an experiment in reading involving the International Teaching Alphabet. To make a new group just for the music class seemed unwise for both psychological and mechanical reasons. It was found that there was a significant difference of 26.9 between the two groups in the mean raw scores on the Gould Test and that there were twice as many problem singers in the lower scoring group as there were in the higher scoring group. It was decided that the lower scoring group should be the experimental group since it contained more children needing help. It was reasoned that groups could be equalized by dropping certain pupil's scores at the conclusion of the study. It turned out that children moving away would have made this necessary for certain computations anyway. When the experiments were begun the groups were constituted as follows:

TABLE I

MAKE UP OF THE PILOT STUDY GROUPS IN THE WESTERN ILLINOIS UNIVERSITY LABORTARY SCHOOL

	Experimental Group			Control Group			Both Groups
	No. in class	No. of Problem Singers	Percentage of Problem Singers	No. in class	No. of Problem Singers	Percentage of Problem Singers	Percentage of Problem Singers
Grade 1	18	6	33%	17	3	18.7%	26.5%
Grade 2	16	4	25%	17	4	23.5%	24.3%
Grade 3	17	5	29.4%	18	5	27.7%	28.5%

Pre-tests were completed by the end of September, 1966. Each child's hearing was checked with an audiometer at the beginning of the study. Each child in both the experimental and control groups made a tape recording of at least two of his favorite songs for the "before" part of the "before" and "after" tape recordings. These were to be scored by judges. The same basic experimental techniques and speech to song response materials were used in sequences employed for the same amount of class time--ten minutes twice each week for eighteen weeks--in all three grades in the experimental classes. Experimental classes were permitted to use song material appropriate to the grade level for remedial purposes. Control groups were to have the same classroom music program as the experimental groups except for the actual experimental remedial sequences. The same special music teacher taught all four groups in grades 1 and 2. Another special music teacher taught both the experimental and control groups in grade 3.

Early in the course of the pilot study phase, the project staff decided to supplement the studies begun in the Western Laboratory School with case studies in selected public schools. There were several reasons for this: (1) although membership in the Laboratory School is deliberately heterogenous as far as admission policies are concerned, the pupil population of the school is naturally fairly homogenous because of its location in a university community in a relatively sparsely populated midwestern rural area; (2) music instruction was to be conducted entirely by the special music teachers and four of the six classrooms involved in the pilot studies were to be taught by the same teacher; (3) a number of special music teachers, classroom teachers and one expert in research in music education were known to be carrying on successful work in helping problem singers learn to sing; it was thought highly desirable to get some first hand evaluations of their successful procedures and materials, a number of which gave promise of being useful in the classroom experiments of Phase III. By January 1, 1967 case study projects were underway in the elementary schools of Quincy and Princeton, Illinois; Virginia Beach, Virginia; and Cleveland, Ohio; and in the non-major music classes conducted by Dr. John Sheldon at San Diego State College. A total of 82 children (and students) and 8 teachers participated.

Cooperating teachers who conducted the case studies were provided with all of the materials and procedures used in the Laboratory School pilot studies, but were instructed to vary them as they saw fit, and to try out their own ideas and materials freely. Before and after tape recordings were made and evaluated by judges as in the pilot studies. All teachers of both pilot studies and case studies charted the progress of pupils involved and kept a careful record of successes and failures. An analysis was written at the beginning of the study of each child's singing difficulties, and at the end of the study each teacher made a detailed report in writing to the project director. A summary of the results obtained by each group in Phase II is given in the chapter on results in this report.

3. Phase III - Experiments in the Public Schools

The third phase of the project, from July, 1967 to June, 1968 consisted of classroom experiments in the public schools. Again, as in Phase II, case study projects were also planned to provide supplementary data.

Schools chosen for the classroom experiments were within one days easy driving distance so that the project director could make frequent visits. In each school cooperating teachers had expressed interest in the problem of the study and in several instances had conducted case study projects during Phase II. Each experimental classroom had a corresponding control group at the same grade level. All grade levels from grade 1 to grade 6 were represented by at least two classrooms. Kindergarten classes were not used for the reasons given earlier in this report. Average class size was 35 pupils. None of the classes was sectioned homogenously in any way, but rather represented a cross section of pupils in that school in that grade.

During the first two months of school, teachers were asked to identify pupils in experimental and control classes who needed help with learning to sing. The process of identification was to take place during the course of the regular singing activities. Although a cut-off score on the Gould Test had been tentatively arrived at during Phase II it was not used as a basis for identification of problem singers pending further attempts at validation of it.

Once problem singers were identified they were given the Gould Test as a pre-test and made the before tape recordings of the before and after set of songs sung individually. After orientation and briefing sessions, cooperating teachers began using the experimental sequence developed during Phase II with experimental classes. They were instructed to adapt the experimental sequence to the singing materials they planned to use in their classes and to use as nearly as possible the same materials minus the experimental sequence in the control classes. Teachers were urged to integrate the experimental activities into regular singing experiences to make the learning situation as normal as possible. This was done in two ways. One way was to begin with the experimental activities using them as a warm-up. The other way was to utilize the experimental items as part of the techniques used in learning new songs and improving songs that the class could sing.

As the experiments progressed, teachers of experimental groups were given the approval by the project director to conduct some of the experimental activities outside of the regular classrooms in grades 4, 5 and 6. Some of this was done individually and some was done with the problem singers meeting as a group by themselves. The prescribed time of 10 minutes twice a week for 18 weeks was kept in mind by all teachers but no attempt was made to adhere to it with complete rigidity. Sometimes, for instance, it may have been 20 minutes once a week, especially if problem singers were meeting separately.

After 18 weeks experimental and control children were given the Gould Test as a post-test and after tape recordings were made for each pupil using the same songs as the before tapes. (This may have been a mistake to some extent as it was observed that occasionally bad habits recurred on these songs which were not evident in songs learned after progress with singing skills had occurred.) A panel of judges provided improvement scores on the before and after tapes. These scores were correlated with the gain scores (difference between pre-test and post-test scores) on the Gould Test.

Each teacher kept a record of her observations of each child of the experimental and control groups and provided a summary of her observations and conclusions at the end of the experiments. The project director made frequent observations and assisted in most cases with the administration of the pre-tests and post-tests. The following table shows the makeup and location of experimental and control classrooms:

TABLE II

MAKEUP AND LOCATION OF EXPERIMENTAL AND CONTROL CLASSROOMS

Grade	Schools all in Western Illinois	No. of Experimental Classes	No. of Control Classes	No. of Experimental Problem Singers	No. of Control Problem Singers
1	Geneseo	1	1	11	8
2	Quincy	1	1	9	8
3	Quincy	1	1	9	6
3	Geneseo	1	1	11	8
4	Princeton	1	1	12	11
5	Macomb	1	1	9	6
6	Quincy	1	1	9	6
	TOTALS	7	7	70	53

TABLE III

CITY POPULATION AND ETHNIC GROUPS REPRESENTED IN EXPERIMENTAL AND CONTROL GROUPS

School	City Population	Ethnic Groups Caucasian	Ethnic Groups Non-Caucasian
Quincy	50,000 to 100,000	White-European	Negro and Latin American
Macomb	20,000 to 50,000	White-European	Negro
Geneseo	5,000 to 10,000	White-European	Latin American
Princeton	2,000 to 5,000	White-European	Latin American

The case studies in more distant cooperating schools provided data from larger schools. These schools were Cleveland, Ohio; Oakland, California; and Grand Rapids, Michigan. Ethnic groups represented in the case studies in addition to those of the classroom experiments included Polynesian, Oriental and American Indian.

Additional experimental classes were conducted at San Diego State College with non-major music classes and at the Western Illinois University Laboratory School with first grade music classes. These experimental classes used pre-test and post-test with the Gould Test, before and after tape recordings, and the log of teacher observations. In other respects they did not follow the pattern of the public school experiments. There were no control groups. Experimental activities were based on the experimental sequence prescribed for the experimental classrooms but contained many variations.

Data for the project was obtained from Marilyn Humpherys at Ricks College in Rexburg, Idaho. Miss Humpherys developed 20 case studies of adults and college age students for a Masters Thesis which was submitted and accepted at Brigham Young University in 1967. The before and after tapes of each case study subject were evaluated by the panel of judges used in Phases II and III. These scores were correlated with other improvement scores of before and after tape recordings of the Phase III experiments.

RESULTS

1. Phase I

Results of the survey of opinions concerning children's singing problems were received from 602 respondents. Considerable weight was attached to them by the project staff because accompanying descriptions of the work they were doing indicated that a large majority were actively engaged in conducting singing experiences for children or had had first hand experience with one or more of the project's sub-problems.

The following table shows the percentage of incidence of singing difficulties by grade level. It is interesting to note the similarity of the percentage of incidence found for all grades to the 18% found in the study of Jersild and Beinstock referred to earlier in this report.

TABLE IV

PERCENTAGES OF THE INCIDENCE OF PROBLEM SINGERS
(Children Who Can't Carry a Tune)
CONTINUING THROUGH THE YEAR

1st grade - 34.6% problem singers
2nd grade - 24.2% problem singers
3rd grade - 17.8% problem singers
4th grade - 12.9% problem singers
5th grade - 11.8% problem singers
6th grade - 11.0% problem singers
all grades - 18.7% problem singers

Opinions as the terminology to be used in describing the child who has difficulty in learning to sing revealed that 99% of the respondents felt that it was necessary to use some term. The other 1% indicated that there was no accurate or acceptable term. The most popular term, receiving 21% of the vote, was "uncertain singer". "Out of tune singer" was next in order of popularity with "non-singer" close behind. Only 14 out of 602 respondents selected the term "monotone" -- less than 3%. A total of 37 different terms were suggested. These included "beginning singer"[8] and "inexperienced singer" -- terms which came to be regarded as most appropriate for this project. (Although the term "problem singer" had already been adopted by the project staff by the time survey results were processed and the term stuck for the duration.)

Opinions as to the nature of singing problems fell into classification of the problems of 1) the "too low singer", 2) the "too high singer", 3) the "one note singer", 4) the singer whose problems were a combination of all three and 5) the psychologically inhibited singer. Sixty-two percent believed that all children can and do match certain tones.

Opinions as to the causes of singing problems are listed here in rank order of frequency listed by respondents:

1) Inattention to pitch and failure to notice pitch changes.
2) Psychological inhibitions toward singing created by various environmental impacts.
3) Inability to coordinate the vocal mechanism with pitches heard. (Included inability to hear pitches.)
4) Low speaking voice.
5) Lack of interest in singing attributed to a variety of causes such as inability of teachers and unappealing materials.
6) Lack of practice in singing.
7) Lack of exposure to music at home.

In answer to the questions, "Can all children be helped? To what extent?" Twenty-nine percent expressed the opinion that all children (excluding those with organic or other handicaps) can be helped sufficiently so that they can participate successfully in classroom singing activities. Less than 1% believed it impossible to help some children. The other 70% believed that all children can be helped some but were doubtful as to how much can be accomplished with extremely difficult cases of non-singing.

Thirty-four percent of the respondents felt that the best time to help children was in the primary grades (1-3). Eleven percent indicated that this help should not be given until grades 4-6. Nine percent gave "write-in" votes to kindergarten as the best age for remedial help, in spite of the omission of this age level from the survey question. The remainder of the respondents indicated that children who had severe singing difficulties often needed remedial help throughout the grades. Many of these expressed doubt that some children could be completely "cured" in the primary grades.

Remedial techniques suggested in the survey included in order of frequency listed: 1) tone matching drills, 2) use of speech devices, 3) use of bodily movements, 4) use of song pattern devices, 5) use of mechanical devices such as piano, bells, recorders, etc., 6) miscellaneous activities including humming, whistling, siren and other sound effects, listening experiences, group participation, placing beginning singer near a strong singer, atmosphere-encouragement, imitation-echo, pitching songs within speaking range of the child, individual attention. It is interesting to note that in all of these the emphasis is on participation -- isolation of the problem singer is notably absent as a recommended procedure.

Conclusions drawn from the observation and conference activities of Phase I will be discussed in the next chapter. It is important to note, here, however, that the many observations of pupils and teachers in action led to a focus on the dual importance of concept formation and skill development. The kinesthetic aspects of learning to combine tonal images with vocal responses seemed to stand out as the process of singing improvement was noted. The project director came to believe that after a child who has had singing difficulties understands the concepts of singing he must then be led to develop a vocabulary of aural and mental skills as well as a vocabulary of vocal motor skills. When the two vocabularies combine to form a single vocabulary of basic singing skills which functions at the instinctive or habit level, his mind becomes increasingly free to expand his singing repertory.

Many children seemed to need developmental experiences in which the various concepts and skills were separated and experienced singly. Often speech and language problems were involved in singing difficulties. Initial progress seemed to occur when the words were left out entirely.

Results of the pilot studies conducted in the Western Illinois University Laboratory Schools from September 1966 to June 1967 are as follows:

TABLE V

PRE-TEST AND POST-TEST MEAN RAW SCORES AND STANDARD DEVIATIONS

FOR THE EXPERIMENTAL AND CONTROL GROUPS

	Pre-test Mean	Post-test Mean	Pre-test S.D.	Post-test S.D.
Grade 1 Experimental	222.3	290.1	46.2	29.6
Grade 1 Control	249.1	278.3	53.7	29.9
Grade 2 Experimental	257.0	300.0	57.3	18.0
Grade 2 Control	253.0	279.2	50.9	34.1
Grade 3 Experimental	255.4	290.2	48.6	34.6
Grade 3 Control	251.1	279.2	58.1	50.9
All Grades Exp.	242.5	295.5	49.5	28.3
All Grades Control	251.2	278.9	53.9	38.8

The reader is asked to compare the gain in the mean raw scores of the experimental groups with those of the control groups. The greater effectiveness of the experiences in all experimental groups over all control groups in terms of raising test scores is indicated. The greater decrease in standard deviations of the post-test scores of the experimental groups as compared with the control groups is also significant in that it reflects the ability of children who had been problem singers to participate in the singing activities on a more nearly equal basis with the other children. To ascertain more exactly the significance of gain made by the experimental groups over the control groups the gain scores (the differences between the pre-test and post-test scores) comparing the gains of experimental groups and control groups in each grade and in all grades were tested for significance:

TABLE VI

MEAN GAIN SCORES OF THE EXPERIMENTAL AND CONTROL GROUPS

	Mean Gain Scores Exp. Group	Mean Gain Scores Control Group	Level of Significance of Gain of Experimental Groups
Grade 1 All Children	67.7	29.1	beyond the .001 level
Grade 2 All Children	48.0	24.9	beyond the .05 level
Grade 3 All Children	45.6	28.1	beyond the .05 level
All grades All Children	53.04	27.34	beyond the .01 level

An examination of the pre-test and post-test scores made by the children who had been classified as problem singers by screening, that is, having made a score of 208 or less on the pre-test, revealed the following results:

TABLE VII

CHILDREN SCORING BELOW THE CUT-OFF ON THE

PRE-TEST AND POST-TEST

	Grade 1 Exp.	Grade 1 Control	Grade 2 Exp.	Grade 2 Control	Grade 3 Exp.	Grade 3 Control
Children scoring below 208 on the Pre-test	6	3	4	4	5	5
Children scoring below 208 on the Post-test	0	0	0	1	1	3

	All Grades Exp.	All Grades Control
Children scoring below 208 on Pre-test	15	12
Children scoring below 208 on Post-test	1	4

The large gains made by all children in the first grade experimental group in comparison with the experimental groups of grades 2 and 3 as shown in Tables V and VI are subject to two interpretations: (1) The experimental materials and techniques used in grade 1 which differed from those used in grades 2 and 3 (or were given more emphasis) provided more effective help for all singers including problem singers; (2) first grade children responded more readily to the techniques and materials used than did the older children. The project staff believes that both factors entered into the results.

In comparing the gains in mean scores on the post-tests of experimental and control groups, the reader will note the consistent gains made in singing skills by children in all of the control groups where the experimental sequences were not used. The reader will note, also, that of the twelve children in all control groups who scored below 208 on the pre-test only 4 scored below this figure on the post-test. While comparisons of the after tapes of these twelve control children with those of the fifteen low scoring children of the experimental groups definitely revealed more improvement in singing skills by the experimental children, as was indicated by comparisons of gain scores given in Table VI, the gains made by the control children were significant beyond the 5% level. These gains may be attributed in part to the intensive work done in all of the pilot study groups with discriminative listening to pitch and to the dramatization of pitch direction. No restrictions were placed on the control groups for this kind of activity. It was believed also that their gains might be partially due to the greater attention to singing problems on the part of the teachers, because of the emphasis placed on such problems by musical experiences of the study. The staff believed also that these gains further corroborate the conclusions drawn by Robert Petzold in his recently completed study concerning the relationship of maturity factors to the ability to perceive and reproduce pitch with the voice.

In relation to the increasing difficulty in helping problem singers as they grow older it was observed again and again during the pilot studies that the child who has not found his true singing voice or learned to discriminate pitches tends to persist with his incorrect habits in direct ratio to the amount of time he has been allowed to continue to reinforce those habits.

In relation to the large gains made in the first grade experimental group there lies a story. A plateau had been reached with several "too-low singers" in the first grade experimental group after two months had elapsed. Problem singers had learned to raise and lower their voices and match pitches around the tonal centers nearest to the mean tones of their normal speaking voices. They had learned to experience unison in their speaking ranges and to sing several songs passably well alone, but with the harsh, throaty quality which often characterizes "too-low singing". In most cases they had little success in matching consistently with the rest of the class at regular pitch levels--middle C to a 9th above--and in several cases were unable to match with the class when songs were lowered to their speaking ranges. Something was needed to help them find their voices in the higher range and to develop habits of using these pitches in this higher voice with other children. At this point techniques and materials developed around the use of the syllable $\bar{o}\bar{o}$ were added to the experimental sequence.

Similarly, later on, after all of the problem singers had developed some facility in using the $\bar{o}\bar{o}$ syllable in song melodies it was decided to add devices using other vowels. This was done for two reasons: (1) it was hoped, and later proved true, that the use of other vowels would provide a smoother transition from the use of the $\bar{o}\bar{o}$ syllable on patterns and melodies; (2) it was reasoned that the use of the more open vowels might tend to open up the voices of some of the children who sounded a bit pinched or breathy (or both) when attempting to apply the $\bar{o}\bar{o}$ vowel quality to the words of songs. At any rate, as a result of these added materials and devices immediate dramatic progress was made by every child. In several cases this began with a simple two tone pattern such as "Hoo! Hoo!" in the song of the same name.[9] The two tones then quickly expanded into longer patterns and then to melodic phrases. When after tape recordings of these children, made at the time of the post-tests, were placed on the same tape with their before recordings the claim of the effectiveness of the added sequence was substantiated. This was indicated by the judges improvement scores given each child when his before and after tapes were evaluated.

A word must be said about the reactions of these children when they began to gain competency in singing at the class pitch levels in unison with other children. Initially the realization that they were doing this successfully was in all cases one of extreme pride and joy expressed overtly in varying degrees and in varying ways. Often the child became very eager to sing alone and seized every opportunity to show off his newly found skill. (Even in the first grade the children learn very quickly if their singing voices are unpleasantly differenct from the others.) As these children acquired more skills in singing, permanent changes in attitude took place. In several cases their status in the peer group changed noticeably, as did their own self-concepts. Classroom teachers found several taking more interest in doing accurate work in other learning activities. A definite upsurge in self confidence was observed in several cases.

A word should also be said about the effect of the classroom experimental activities on those children in the class who were not classified as having singing problems. In the first place, they enjoyed the activities and were eager to take their turns on the individual responses. In a very short time after the experiments started there could be little doubt in anyone's mind as to which children needed help most. (The experiments were usually done as "warm-ups", and the children were told they were working on improving their voices and the "sound" of their singing.) But as common knowledge as to which children had problems developed, all of the children took more and more interest in participating. They were fascinated as they could hear progress being made. They were anxious to help with their own voices, and came to feel that the skills acquired by the problem singers were their achievements too. Incidentally, directing the "good" singers attention to pitches and intervals in game and activity situations had a noticeable positive effect in comparison with the corresponding control groups on each group's ability to sing melodies accurately and on pitch. The same can be said for development of the free, open, floating tone quality desired for all children's singing groups. The effect on tone quality of the use of the neutral syllable $\bar{o}\bar{o}$ and subsequently of the use of other vowels on song melodies and pattern responses was quite noticeable in favor of the experimental group in grade 1 as compared with the corresponding control group.

Results of the supplementary case studies conducted in cooperating schools during Phase II are as follows:

The Quincy, Illinois Case Studies. Under the leadership of Dale Kimpton, Director of Music for the Quincy, Illinois Public Schools, twenty case studies were conducted by Mrs. Marjorie Ahlstrand and Miss Marilyn Emory, music consultants. These were conducted in grades 1 to 4, were of 18 weeks duration, and children were given approximately 10 minutes of help each week. Some of the help was given in private coaching sessions and some in the regular classroom music sessions. Both consultants were free to use the techniques they were currently having success with. Before and after tapes were made and evaluated in relation to a carefully kept record of each child's progress. Conclusions reached by this cooperating team are as follows:

Techniques found most helpful for problem singers:

1. Using songs which move in scalewise patterns through a short, easy range.
2. Using songs with a limited number of phrases and with repeating phrases. Modulating by half steps upward at the end of each verse.
3. Stretching or reaching to attain high patterns.
4. Songs or exercises that begin with a descending pattern such as "Hey, Betty Martin".
5. The "me-ow" exercise helps children find their soft, head voices. The $\bar{o}\bar{o}$ also was effective.
6. Always pitching the song in the key best for the child at his stage of development.

The tape recordings documented the extremely successful improvement achieved by these children.

The Virginia Beach Studies. Mrs. Irene Korte, music consultant in the Alanton Elementary School of Virginia Beach, Virginia developed case studies with twelve 3rd grade children in cooperation with the children's classroom teacher, Mrs. J. Taylor. The children worked in two special classes, in individual coaching sessions and in group activities with the rest of the third grade class. The time spent was approximately ten minutes twice each week for 18 weeks for each child.

Most successful activities were:

1. Musical conversations starting on a low pitch, moving to a higher pitch, and returning to a low pitch.
2. Listening activities where the children listened to two or more tones on the piano and told which ones were higher. Sometimes the children closed their eyes and moved their hands upward, downward and same to show melodic progression. Drawing the ups, downs and sames of favorite melodies with pencil and paper.
3. Playing melodies by ear on the piano and bells and observing them step up and down, skip up and down and stay the same. The first line of America was a favorite.
4. Children worked on "hearing songs with their heads". A favorite device was for one child to sing a phrase of the song alone with the rest chiming in on the next phrase. This provided a ready made unison for the child being helped as his voice was reinforced by the others instead of being drowned out.

Before and after tapes and case study reports documented the successful work done with these children.

The Princeton, Illinois Studies. Miss Peggy LaRowe, assisted by the classroom teacher, Mrs. Elizabeth Smith developed ten case studies of fourth grade children in the Washington Elementary School in Princeton, Illinois. Before and after tapes were made and a carefully detailed record of progress for each child was kept. The dramatic improvements made by these children in group and indiviual sessions were attributed to the following techniques and materials in the case study reports:

1. Speech activities using verses of classroom songs and poems from the language arts activities. Children developed both voice control and improved voice quality.
2. Bodily motions and hand motions to dramatize melodic direction.
3. Use of the neutral syllable loo and siren imitations to get the voice up into the singing range.
4. Use of songs with a long skip to a high tone to provide experiences in "aiming" for a high tone rather than "climbing" to it. "Shifting gears" for high tones, and working from the matched high tone back to lower tones of the melody.
5. Use of the tape recorder from time to time to let children know how they were progressing.
6. Working on "hearing your own voice" when others are singing. Some children acquired the ability to sing melodies at classroom pitch when singing alone; but when they attempted to sing with the rest of the class their voices dropped back to a low monotone. When this happened the child's attention had been diverted away from his own voice by the voices of the others.

> As he learned to keep listening to himself he was able to continue to sing on the correct pitches when singing with other children.

After these studies were completed it was learned from Miss Edna M. Hehn, Music Supervisor in the Oakland, California elementary schools that a number of children having this difficulty in her classes had been helped by closing one ear lobe with the fore finger. This technique causes the child's voice to vibrate more in the head and at the same time he can hear the others through the ear left open. Further experiments with this technique will be tried during the 1967-68 school year.

The Cleveland, Ohio Studies. Some extremely interesting and effective case studies were conducted by Miss Ruth Shane, Music Consultant, in cooperation with Mrs. Helen Socolofsky, Music Supervisor and Mr. Robert H. Rimer, Directing Supervisor of Music for the Cleveland, Ohio Public Schools. The ten case studies were developed with 4th, 5th, and 6th grade children in a school in a metropolitan area of one of the nation's largest and busiest cities. Motivation for the children used in the study was the prospect of learning to sing well enough to become members of one of the very fine elementary choirs maintained in the school. These choirs are groups of which faculty and children of the school are justifiably very proud. Materials used in helping these children solve their singing problems consisted of warm up vocalises used by the choirs and patterns from favorite songs of the classroom music program. The children were given individual coaching sessions as well as group activities in the classroom using tone bells and other instruments for dramatizing pitch direction. The vocal drills used are as follows:

1. Tonic triad using "lah" and "doo" in several keys to fit the child's range.

2. "Vee" to "voh." The "vee" was sung on the ascending tonic triad and changed to "voh" for descending scale steps in different keys.
3. Loo on the Ring Around the Rosie ostinato in different keys.
4. "Noh" sung on the descending and ascending tonic arpeggio in different keys. Children had to begin on a high tone and work down.
5. "Nah," "nay," "nah," "nay" sung on descending thirds beginning on the dominant and ending on the low tonic. Children began on the fifth tone of the scale with a descending minor third.

Before and after tape recordings of these children's favorite songs indicated dramatic improvements by all. Several children of the group had improved so much that they were looking forward to participating in the choir program in the near future.

The San Diego, California Studies. Dr. John Sheldon of the San Diego State College in San Diego, California has been conducting research activities for several years which are concerned with the relationship between lack of ability to sing and pitch and tonal memory. For the project reported here Dr. Sheldon was asked to develop a cooperative study in which the effects of a listening sequence designed by him to develop skill in pitch discrimination on the ability to sing were measured. Dr. Sheldon described his project as follows:

> "Ten non-music majors were selected from classes in music fundamentals at San Diego State College for the purpose of developing pitch discrimination and tonal memory. Each subject was asked to sing America which was placed on tape and scored through the following means. A Stroboconn was used to determine the starting pitch for each singer and the deviance in pitch of either plus or minus from "my" to "tis," "sweet," "of," and "sing." Differences were totaled and divided by 4 to find the average error between each of the points.

> Each subject used in the study was found to have a poor ability in pitch while singing America. Each was asked to attend one five to ten minute period weekly in each area of pitch discrimination and tonal memory. In the area of pitch discrimination each subject was asked to listen to small differences in pitch for determining at what level each could hear any differences between two sounds. Pitches were played between 200 and 800 cycles which approximates the normal singing range. Each subject was asked to determine if the pitches were the same or different. As each subject improved throughout the various sessions, finer differences in pitch were sounded. Each student was found to make progress weekly during the study. A light was used to indicate to each student if his response was correct.
>
> In the tonal memory sessions, each student was asked to determine which note was changed in a sequence of 3, 4, and 5 tones in a series. Pitches were played from I, IV, VI, III and VI chords. Series of three were used at the beginning and as each subject progressed he went to four and five in a series. Each subject was given a notification of correctness in response immediately.
>
> The average pitch, tonal memory, and singing score on America improved as a result of the study. Conclusions were that pitch-deficient subjects can be improved in singing when pitch is the criterion measure. This can be done through auditory means even when singing is not practiced. Also, pitch and tonal memory as measured on the Seashore Measures of Musical Talents can be improved through proper auditory procedures. Through use of the Walsh Test for differences before and after training, the subjects were found to improve at the 1% level of confidence in pitch discrimination, and at the 5.6% level for tonal memory and pitch in singing America."

Before and after tape recordings on which the 10 case study subjects sang America revealed definite improvement in almost every case.

TABLE VIII

BEFORE AND AFTER DATA OF THE SHELDON STUDY

	BEFORE					AFTER		
	Pitch	Rhythm	Timbre	Tonal Memory	Pitch Error: America	Pitch	Tonal Memory	Pitch Error: America
Subject 1	40	26	35	27	370	38	24	150
Subject 2	35	29	35	20	300	47	19	230
Subject 3	26	25	37	13	1130	37	19	750
Subject 4	32	21	31	16	210	40	18	120
Subject 5	32	28	43	23	320	38	28	320
Subject 6	35	24	28	17	515	31	15	350
Subject 7	20	26	38	18	235	42	23	235
Subject 8	28	28	39	24	350	36	23	170
Subject 9	19	21	44	21	100	41	20	50
Subject 10	36	28	40	23	340	38	24	230
Average	30.8			20.2	357	34.8	21.3	230.5

> "In interpreting the Seashore 'pitch' and 'tonal memory,' the higher the score the better is the response. A 50 score was perfect for pitch and 30 for tonal memory. In pitch error in singing America the lower the score the lower the error with zero being theoretically perfect. Seashore 'rhythm' and 'timbre' tests were given in the before section in helping to determine these varibles for the multiple regression equation used in screening."

Activities with Problem Singers at Grand Rapids, Michigan. The work with problem singers observed by the writer in the Grand Rapids, Michigan elementary schools made valuable contributions to the project. Miss Doris James, Elementary Music Consultant, developed an approach to learning how to sing for the Grand Rapids elementary schools and for the summer music workshop which she conducted for the Grand Rapids Recreation Department. Her "Learning How To Sing" classes used the staccato and legato double ōō sound, which Miss James describes as book with the b and k omitted. She also taught the children to use several voices. "This is my talking voice," they learn how to say normally. "This is my whispering voice," they whisper. "This is my yelling voice," they yell. And "This is my singing voice," they sing. "All of these voices help in the development of their singing capabilities," says Miss James.

Case Studies in the Western Illinois University Laboratory School. A few case studies were developed with children in the upper grades in the Western Laboratory School during the 1965-67 school years. Of special importance was the examination of the relationship of early change in boys' voices to singing problems. A longitudinal study of a ten year old boy whose voice dropped suddenly in grade 4 was begun in 1961. At the time it was thought that the drop might have been due to damage to the vocal chords or nodules. The low range persisted throughout grades 5 and 6. He was allowed to sing unison melodies an octave lower and was provided with low descants and harmony parts on two and three part songs. By 7th grade he was singing baritone in a mixed choir which used the system of voice placement of soprano I, soprano II, cambiata and baritone. Presently he sings excellent baritone in a high school choir and recently took the part of Fagin in a production of "Oliver." His voice range seems little changed since 4th grade. It is now believed that his voice drop was an early manifestation of puberty.

Also of special interest were case studies of five fourth grade boys who seemed to have regressed in singing ability between the 3rd and 4th grades. The boys met in a group from time to time to "work on their singing voices" just as others in their class were going to the speech or reading consultants or were having special help in math. A strong espirit de corps developed almost immediately with this group. This rapport had such profound effect on each boy's attitude toward singing that the carryover of increased desire to sing was noticed immediately in the regular classroom music singing activities. Comparisons of before and after tape recordings and observations made during the remedial group sessions indicated that the regression in singing skills was due principally to the greater complexity, greater length, and wider range of the song materials being used. Responses to short, simple, "catchy" folk songs with short range was at their third grade level of performance. When given more repetitions on the longer, more difficult fourth grade songs, and when time for drill on the melodic intervals was given by slowing down the tempo and using neutral syllables these melodies were mastered without great difficulty. In two or three cases the unpleasant "too-low" singing they had done in the regular music class before the case studies were begun was done as a "cover-up" for the fact that they were finding melodies and words difficult. In one case a "too-low" singer seemed to have experienced a voice drop similar to the one described above. He was encouraged to sing descants, ostinatos, low harmony tones and octave lower unisons which he did with great enjoyment and fair accuracy in the remedial group and later in the regular class.

Reliability coefficients for the Gould Test were computed at the time of completion of the pilot studies.

TABLE IX

RELIABILITY COEFFICIENTS FOR THE GOULD TEST

Grade 1	.92
Grade 2	.95
Grade 3	.96
All Grades	.94

Validty coefficients were computed for the test during the summer of 1967. These were computed by correlating the gain scores obtained by each pupil, post-test score minus pre-test score, with the improvement scores assigned the pupils by a panel of judges from before and after tapes of their singing voice. Validity coefficients obtained in this manner are as follows:

TABLE X

VALIDITY COEFFICIENTS FOR THE GOULD TEST

OBTAINED FROM JUDGE'S SCORES

Grade 1	.51
Grade 2	.89
Grade 3	.67
All Grades	.66

Reliability of the scorer of the Gould Test was checked from time to time by correlating at subsequent intervals scores obtained from the tape recorded answers children gave. With practice the test scorer -- the project director who administered the test and scored pupils tape recorded answers later -- attained a reliability coefficient of .94. (Reliability coefficient for Phase III was .89). Appendix B describes the scoring system for the Gould Test.

3. Phase III

Results of the classroom experiments conducted in the public schools of Macomb, Quincy, Princeton and Geneseo, Illinois are summarized in the following tables showing scores obtained on the Gould Test. The perfect raw score figure is 318.

TABLE XI

PRE-TEST AND POST TEST MEAN RAW SCORES AND STANDARD DEVIATIONS
FOR PUBLIC SCHOOL EXPERIMENTAL AND CONTROL GROUPS

ALL CHILDREN

		Pre-test Mean	Post-test Mean	Pre-test S.D.	Post-test S.D.
Grade 1	Experimental	175.5	231.3	38.2	35.0
Grade 1	Control	172.5	189.3	30.5	34.8
Grade 2	Experimental	247.1	251.1	59.7	43.4
Grade 2	Control	201.4	241.6	46.8	47.3
Grade 3 A	Experimental	212.9	269.1	36.1	35.0
Grade 3 A	Control	227.7	255.6	43.1	40.4
Grade 3 B	Experimental	231.7	268.9	34.0	31.7
Grade 3 B	Control	175.8	209.8	21.8	24.1
Grade 4	Experimental	231.8	258.7	43.8	44.9
Grade 4	Control	229.7	237.4	43.3	45.4
Grade 5	Experimental	233.1	283.1	22.9	15.1
Grade 5	Control	260.0	261.2	43.5	41.9
Grade 6	Experimental	214.2	257.7	38.0	28.9
Grade 6	Control	244.0	240.3	27.8	24.9
All grades	Experimental	225.4	267.0	34.7	31.4
All grades	Control	212.9	257.7	36.7	36.9

TABLE XII

PRE-TEST AND POST-TEST MEAN RAW SCORES FOR CHILDREN SCORING 208 OR BELOW ON THE PRE-TEST IN PUBLIC SCHOOL EXPERIMENTAL AND CONTROL GROUPS

		Pre-test Mean	Post-test Mean
Grade 1	Experimental	171.5	245.2
Grade 1	Control	174.8	202.6
Grade 2	Experimental	176.9	257.5
Grade 2	Control	174.9	216.9
Grade 3 A & B	Experimental	179.5	249.1
Grade 3 A & B	Control	170.7	198.4
Grade 4	Experimental	184.0	203.5
Grade 4	Control	162.0	163.9
Grade 5	Experimental	196.2	261.7
Grade 5	Control	175.1	187.0
Grade 6	Experimental	166.0	225.3
Grade 6	Control	204.1	222.4
All Grades	Experimental	176.1	245.0
All Grades	Control	173.3	201.6

Similiar statistics for the experimental groups in the Western Laboratory School at Macomb, Illinois and at San Diego State College, San Diego, California were obtained. There were no control groups used in these schools.

TABLE XIII

PRE-TEST AND POST-TEST MEAN RAW SCORES AND STANDARD DEVIATIONS OF THE WESTERN AND SAN DIEGO EXPERIMENTAL GROUPS - PHASE III

	Pre-test Mean	Post-test Mean	Pre-test S.D.	Post-test S.D.
Western Laboratory School				
Grade 1, Section 1 (Exp.)	278.2	288.2	28.4	32.9
Grade 1, Section 2 (Exp.)	238.5	263.8	47.7	37.8
San Diego State				
Special Remedial College Group	205.0	243.1	29.8	25.1

The reader will note that the differences between pre-test and post-test mean scores are greater for all experimental groups than for control groups of the public school experiments in Table XI which includes children whose pre-test scores were above 208 as well as those below. In all but one experimental classroom standard deviations for the post-test were considerably reduced from those of the pre-test -- an indication that the poor singers were catching up with the better singers.

In Table XII the differences between means of pre-test and post-test scores of experimental children compared with those of control children speak for the consistent effectiveness of the remedial sequence with children who have serious singing problems. It should be pointed out for Table XIII that there were no children below the cut-off score of 208 in the first grade, section 1 of the Western Laboratory School, due to excellent work done in kindergarten the year before. This accounts for the smaller gain from the pre-test to the post-test and possibly for the slight increase in the Standard Deviations for this group. The college students in the San Diego group were selected because of the seriousness of their singing difficulties. All but one scored below 208 on the pre-test and the other barely above. The reader is asked to compare their pre-test mean with the post-test mean for all grades of children of public school control groups with scores below 208 on the pre-test.

In relation to the 208 cut-off score, the reader is reminded that this score was arrived at empirically by the project staff during the pilot study phase of the project. Cooperating teachers in Phase III did not use it, but were instructed to designate children for the experimental and control groups who, in their opinions, needed help. Two members of the panel of judges who scored before and after tape recordings of songs sung by the children of Phase III felt that several children sang so well on the before tapes that they should be excluded from the study. A check of the pre-test scores of these children revealed that they ranged from 211 to 268. This would indicate that the 208 cut-off score might be fairly close to the point at which serious singing difficulty begins. The project staff, however, came to reject the idea of a cut-off score whether obtained by a multiple regression equation or some other means. The reasoning behind this was that if a child needs help he should have it regardless of the score he makes on any test. It was felt also that the value of using the test lay in using it to determine "how much a child can sing" rather than in using it to place him in a category of singer or non-singer.

Statistics relating to the significance of test gain scores (differences between pre-test and post-test scores) of experimental and control groups are given in Table XIV . Table XV shows the correlations between gain scores and judges ratings for Phase III. No correlations were computed combining gain scores and judges ratings for Phase II and III because some revisions in the content of the Gould Test were made between the two phases.

TABLE XIV

MEAN GAIN SCORES OF THE EXPERIMENTAL AND CONTROL GROUPS OF THE PUBLIC SCHOOL EXPERIMENTS

	Mean Gain Scores Experimental Group	Mean Gain Scores Control Group	Level of Significance of Gain of Experimental Groups
Grade 1	55.8	10.5	beyond the .001 level
Grade 2	49.7	- 4.4	beyond the .001 level
Grade 3 A	56.3	27.8	beyond the .01 level
Grade 3 B	42.6	34.0	beyond the .05 level
Grade 4	26.2	7.5	beyond the .05 level
Grade 5	49.8	1.2	beyond the .001 level
Grade 6	43.7	5.7	beyond the .01 level
All Grades	33.5	11.6	beyond the .05 level

TABLE XV

VALIDITY COEFFICIENTS FOR THE GOULD TEST OBTAINED FROM JUDGE'S SCORES - PHASE III

Grade 1	.21
Grade 2	.22
Grade 3 A Grade 3 B	.27
Grade 4	.48
Grade 5	.43
Grade 6	.94
San Diego State	.82
Western Laboratory	.35
All Scores	.49

Throughout the study an attempt was made to determine the ratio of boys and girls designated by their teachers as needing help with singing. In terms of the total number of persons participating including case studies, the boys outnumbered the girls two to one. Out of a total of 405 pupils there were 147 girls and 258 boys who needed help. During Phase III there were 92 boys and 32 girls in the experimental and control classes -- a ratio of three to one. At first and second grade level they were almost evenly divided with the ratio of boys increasing by third grade and in each higher grade until in sixth grade the ratio was 12 to 1 in favor of boys.

In Cleveland, Ohio where case studies were conducted with fourth, fifth and sixth grade children judges improvement scores on the before and after tapes were correlated with judges scores obtained from the same grades of the public school experimental classes resulting in a coefficient of .61. Some children in these studies were carried over from the case studies of the previous year so that they might sing well enough to participate in the very fine Fulton School Choir. In the Spring of 1968 one sixth grade boy in particular was observed by the project director singing in the first soprano section. As a fifth grader he had made some improvement but lacked control and security with pitch and quality in his higher range. The vocalises used in the Cleveland studies (in addition to adaptations of the experimental procedures to regular classroom singing experiences) are reproduced in Appendix C of this report.

In Grand Rapids, Michigan where case study children ranged from ages 7 to 12 (many in ungraded curriculum plans) the judges improvement scores were correlated with randomly selected judges scores of children of the same ages from the experimental groups of Phase III. Here the correlation coefficient was .69. A description of experimental procedures is quoted here.

1. Making certain the children could do the following on cue:

   Saying -- This is the way I talk.
   Whispering -- This is the way I whisper.
   Yelling -- This is the way I yell.
   Singing -- This is the way I sing.

2. Learning to isolate the neutral vowel sound in LOOK (sounds like uh). This is the fundamental sound in good singing and is the basis on which to build the singing voice. This sound cannot be done successfully without the use of the diaphragm. The diaphragm and its activity is not mentioned to the children.

3. Listening to the instructor transferring from singing words to using the neutral syllable (always uh) to make them aware of the smoothness with which the transition is made.

4. The children played "SPELL DOWN." Teachers sang melodic intervals and they had to answer exactly or the child next to them "got ahead." Records of their positions were kept in teacher's notebooks. This game was also played with rhythmic patterns.

5. We spent a lot of time at the blackboard when it was possible to determine when the melody lines went up and down in Bluebird and Happy Birthday. They were made aware of the relationships of melody lines to sounds.

6. Recognition of songs by their rhythmic patterns (songs we had recorded).

7. We played starting tones on the melody bells to see if we could sing from any starting tone on the bells. This was a very difficult idea for them to comprehend.

8. When there was a piano in the room we had the opportunity to play tonal patterns of Bluebird, Bluebird. For those who had never played the piano it was an exciting experience.

9. Materials at our disposal were varied:

Campau -- piano only	Lexington -- piano and blackboard
Coldbrook -- neither	Vandenberg -- blackboard only

10. It was interesting to note that the extra attention given to working at the blackboard carried over to their textbooks when we began working on the songs from their own books. We learned that the higher the line of melody goes the more energy has to be expended. Some of the older children enjoyed taking paper home to see if they could remember how the melody line went for Bluebird and Happy Birthday.

The results of the San Diego experiment are quoted directly from the report of the project:

> This research was undertaken to determine what improvement might take place in pitch for those selected from non-music major classes in college. Subjects selected were those nine least able to match pitches and to sing in tune "America."
>
> Each subject received ten ten-minute sessions which included four techniques. Techniques included: (1) matching pitches, (2) identifying changed tones, (3) singing pitch numbers of the scale, and (4) help in singing through work on specific problem intervals in the song "America." In addition, five subjects were given pitch differences on the audiometer and asked to identify any differences on two different hearings. These five subjects were compared against those not receiving this technique

to determine any differences in ability to sing in pitch as measured on the Gould Test. Specifically, these techniques included the following: (1) matching pitches was done in the typical way with vocal and piano pitches given from C to C above middle C and the subject was asked to sing this back, (2) changed tones were played from a series of five tones from the I, IV, or V chords in the key of C in which one tone was changed on the second hearing for which the subject had to identify by the number in the series, (3) the subject was asked to sing back the pitch corresponding to the scale number in the C scale, and (4) each subject was coached on the problem intervals in singing "America" through all three techniques. Those five subjects randomly selected for the audiometer help were tested for the threshold level in which they could properly identify 80 per cent of the correct responses in sameness or different pitches played. When the study began the average error in hearing differences was 23.2 cps whereas upon the completion of the study the average error was 6.8 cps. With this amount of change in pitch, subjects were able to state correctly 80 per cent of the time whether two sounded pitches were the same or different. All techniques used immediate reinforcement through allowing the subject to know if his response was correct or in error.

Findings included the following scores determined from the Gould Test:

	Before	After	Change
Subject 1	178	220	+42
Subject 2	184	235	+51
Subject 3	173	218	+45
Subject 4	183	222	+39
Subject 5	225	238	+13
Subject 6	235	305	+70
Subject 7	193	247	+54
Subject 8	208	251	+43
Subject 9	266	252	-14

The audiometer technique included the following error in cps at which each subject could correctly respond to 80 per cent of two sounds being the same or different:

	Before	After	Change
Subject 2	36	6	-30
Subject 3	28	10	-18
Subject 5	16	4	-12
Subject 7	18	10	- 8
Subject 9	18	4	-14

Conclusions included the following: (1) the first four techniques were helpful in improving pitch in singing as measured by the Gould Test, (2) audiometer training helped subjects in each instance to hear fine differences in pitch, and (3) improvement in audiometer training did not relate to better singing in pitch. Five subjects utilizing the

> audiometer technique improved an average of 29.8 in the Gould Test, whereas those four subjects not using this technique improved 46.0.

Research conducted by Dr. John Sheldon, Spring 1968, was supported in part by the San Diego College Foundation. Dr. Richard Riedman conducted the audiometer research technique.

A description of the twenty case studies conducted by Marilyn Humpherys at Ricks College, Rexburg, Idaho is given in her masters thesis.[10] Before and after tapes of her case study subjects, who were adults and college students, were evaluated by the panel of judges. Improvement scores were correlated with improvement scores assigned by the judges to before and after tapes of the San Diego students yielding a coefficient of .79. Her procedures and results and conclusions which bear great similarity to those of this study should be examined by the reader. A report received from her since her initial study is quoted here:

> I have been involved this summer in working with singing groups consisting of children from ages six to twelve, and it has been a most rewarding experience. There were several out-of-tune singers in these groups, and I was very pleased to find that methods I had used with college students were just as effective with the children. An interesting case was one eleven-year-old boy who could play the piano by ear and yet he sang out-of-tune. He tried to harmonize rather than duplicate pitches and used only his speaking voice. He quickly corrected his mistakes after I explained the singing process to him.
>
> Another discovery I have made is that out-of-tune singers seem to have a greater dependency on harmonic accompaniment than "gifted" singers. Based on my own experience I have difficulty with tonal memory even today. I cannot sight read a part unless I hear all the other parts along with it. In music theory classes I would fail melodic dictation and get an "A" in harmonic dictation. Certainly this phenomenon needs to be tested under scientific conditions, but it may prove to be a significant factor in training children to sing in tune.

The experimental classes in the Western Laboratory School were conducted by Mrs. Judith Wright, Research Assistant in the project. She used no control groups and was able to compare results achieved in each of the two first grade sections where the same procedures and song materials were used. Table XIII and the material which follows it describe the results obtained. The differences in singing ability of the two sections (note pre-test scores) made possible a variety of activities including making video tapes and giving the children the chance to see and hear what they had accomplished.

The case studies conducted in the Oakland, California Elementary Schools provided not only the valuable techniques for hearing one's own voice referred to earlier in this report but much very significant information concerning the singing problems of multi-ethnic groups. Since this project included both Caucasian children from middle and upper socioeconomic groups and children from Oriental, Mexican and Negro groups (mainly disadvantaged), it was possible to make comparisons of progress and to examine the effects on singing achievement of environmental and racial factors. Of the statistics developed from the before and after tapes it is interesting to note here the correlation coefficient of .59 between the judges scores for these children and judges scores obtained for children of similar ages and grades selected from the public school experimental groups. Caucasian children made slightly more progress than the others according to the judges scores. Judges and project staff members thought this was because of the language difficulties of the multi-ethnic group rather than related to singing ability. The Oakland staff also found the Caucasian group slightly more highly motivated to achieve singing improvement as a whole but also found a high degree of motivation among a large percentage of the disadvantaged group.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In drawing conclusions from the data of the project, the project staff had almost no reservations about claiming a high degree of validity for the generalizations indicated by the evidence obtained. What minor doubts there may have been stemmed from the difficulty in isolating the experimental variables. The process of isolating variables was not very compatible with several of the project objectives. It was not compatible with the objective of involving teachers and cooperating researchers of varying musical skills and backgrounds. It was not compatible with the objective of using children of varying ages and backgrounds working in a variety of learning situations and with a variety of speech and song materials. Nor was complete isolation of experimental variables compatible with the objective of conducting experiments within the context of the child's normal musical learning experiences. At the beginning of the project, for instance, it was planned to match experimental and control groups according to several stated criteria. This was possible to a degree in the Laboratory School pilot studies, but was not even attempted during the public school classroom experimental phase because of inability to structure it without disrupting the normal educational processes for the pupils and teachers involved.

In spite of these factors the project staff believes that the overwhelming statistical evidence gleaned plus the knowledge acquired through observation of "children in action" warrant the conclusions that 1) every unhandicapped child can learn to sing, 2) teachers with varying degrees of skill can and will learn to help children who experience difficulty in carrying a tune, 3)this help can be given most effectively in early childhood -- probably the earlier the better, 4) this help can be adapted to a multitude of song materials and speech and song activities and can be adapted to persons of any age who have the desire to learn to sing.

There are two basic principles involved in learning to carry a tune and to use the voice in singing experiences with increasing success and satisfaction. The child must 1) learn to hear, judge and control his own voice and 2) he must experience unison. These principles are not new.[11] But this project has defined and emphasized the sequential formation of concepts and the development of accompanying skills as vital in the process of learning to sing. Furthermore, once the basic concepts are formed the process of skill formation involves the development of the singing vocabulary so that the syncronization of concepts and skills becomes a matter of habit or instinct.

In order to learn to sing one must form 1) a concept of the singing voice and the motor skill of sustaining vocal sounds contrasted with the staccato vocal sounds of speech; 2) a concept of the difference between high sounds and low sounds and the motor skill of controlling the pitch levels of the voice in speech and song; 3) a concept of the sound of a musical tone and the mental skill of translating a tone heard by the ear into a tonal image; 4) a concept of melodic relationship and the mental skill of moving from one tonal image to another; 5) a concept of unison and the combined mental and motor skills of matching the vo[illegible]chanism and the tonal image; 6) a concept of the vocal quality of the true singing voice and the combined mental and motor skills of producing and manipulating this singing voice with or without the mental-motor act of adding words.

For many children the simultaneous application of these concepts with the appropriate skills is most difficult until they have developed a singing vocabulary consisting of the aural and vocal habits involved. Improving in ability to sing with the correct pitches and with singing voice quality is therefore largely kinesthetic in nature. In developing and expanding this singing vocabulary children would be expected to vary in terms of the speed with which the appropriate aural and vocal habits are formed depending on individual mental and physical characteristics and on the amount of singing vocabulary already developed at a given time. Some children require the opportunity to develop slowly, step by step, with the formation of each concept and the mastery of the accompanying skill. The use of two or more of these concepts and skills must come about very gradually and sequentially. Other children can fly through many steps of the process in a very short time once the basic concepts are formed and the kinesthetic patterns are established.

The experimental sequence determined at the conclusion of Phase III is as follows:

1) Speech activities. Learning to control the various levels of the voice in speech. Experiences range from every day spoken phrases such as "Good Morning" and "Hello" to poems, choric speaking and chanting of words of songs to be sung.
2) Speech to song activities. Learning to add musical tones to the speech activities. This was done at first at the pitch level where the child could match. (It was discovered early in the study that all children could match some tones.) Materials used were the same as those used in the speech activities, except that musical stories were added which combined choric speaking and singing short phrases.
3) Experiencing unison in song. For many children this was simply low voice training in matching short melodic phrases and songs in the speaking range -- or wherever they could.

4) Finding the true singing voice. This critical step in many cases could not be achieved until the child had considerable security in matching in his conversational range. It was achieved with very short echo patterns using the ōō vowel -- see Appendix C. The first songs attempted called for only one or two tone responses with the ōō sound in the new (usually higher) range. As soon as consistent successful attempts were made in songs with one or two tone patterns, songs with longer patterns of the response with ōō were used. From singing patterns of several tones to singing entire short songs with the ōō sound was usually an easy and rapid transistion. It was, however, found to be a very important step. It came to be believed that children who had progressed this far might regress if they did not keep singing on the ōō vowel until they had achieved security and confidence in using the newly found voice.

5) Developing the singing vocabulary. The transition from using the ōō sound in the child's newly found voice to singing songs with the words involved the sequential development of several aural and vocal skills. Prototype songs were selected for this purpose with the idea that the teacher would be able to find suitable songs in whatever series of music books the children were using.

Songs used in the pilot studies and classroom experiments to provide drill in making this transition were classified as Types A, B or C according to the skills demanded of the child in matching the melodies.

Type A songs began on the low tonic and proceeded by scale steps up and down the major (or minor) scale in a short range of five or six tones. For many children the negotation of a few scale steps from the tonic could be done in progressively higher keys.

Type B songs, which began on the 3rd or 5th, provided practice in starting a song which began on a tone other than the low tonic. These songs usually contained the interval of the descending minor third, perhaps beginning with it. This interval seemed to be one of the easiest for the problem singer to negotiate with his newly found higher range.

Type C songs contained one or more skips to the high tonic. They provided the improving singer with practice in negotiating the skip to a higher tone from a lower tone. This skill involved mental as well as physical preparation for the higher tone. Children often found it much easier to negotiate these longer interval skips using the ōō sound than with the actual words of the song. They were helped to sing the words on pitch accurately by first singing the ōō sound on the interval.

As the problem singer obtained skill in using his newly found voice in singing these types of songs with the words, he often needed some help with the problems of breathy quality and/or pinched quality. Many children and adults of the study found vocalises and song melodies using Yah, Mah and Nah (and the other vowels) helpful in opening and freeing the voice at this stage of vocal development.

One other aspect of the project was of great interest to the classroom teachers and music specialists involved in cooperating case studies and pilot studies. The group activities beamed toward problem singers which were carried on in the regular elementary music classes had noticeable beneficial effects on the average and good singers in these classes. Much improvement in overall tone quality of the classes was noticed. Improvement in accuracy of intonation, particularly of longer interval skips, was also noted.

An indication of the ultimate contribution of the project to elementary music programs was found in the participating classrooms of the project where every child had found his voice and was singing with his peers using acceptable tone quality and intonation. Such classrooms were primarily vocally oriented. In these classrooms the singing activities formed the core of the program.

A handbook for elementary music teachers describing procedures and materials the study found most successful in the classroom experiments and pilot studies is a part of this report. Continuing activites following the project include the making of sound films and video tapes showing problem singers learning to sing.

2. Recommendations

It is recommended that music specialists and classroom teachers give a thorough trial to the sequential procedures described in this report. It is not necessarily recommended that the actual materials provided in Appendix C of this report and in the accompanying Manual for Teachers be used. Instead teachers are urged to adapt the principles and procedures reported to materials they are now using or may use in the future.

How should the sequential procedures be used? Two ways are recommended:

1) As a warm up for the class, where for a few minutes the children "Work on their singing voices" or "Work on improving their singing."

2) Incidentally with other singing activities and with instrumental experiences such as recorder playing in the middle grades. Using these procedures has

proved very effective when children are in the process of learning a new song or in the process of "working on" or polishing a familiar song.

A further recommendation of the study is that teachers verify the effectiveness of these procedures with older students and adults, especially problem-singers in college music classes. Dare we continue to send teachers into children's classrooms to teach music who can't sing?

Recommendations for future research are: 1) investigation of the vocal responses and potential for developing the singing skills of mentally handicapped children; 2) studies of the growth of musicality through vocal responses of children who are deaf or have serious hearing loss; 3) studies of singing problems relating to physical handicaps of the vocal mechanism such as nodules on the vocal cords and chronic throat and sinus disorders; 4) development of a teaching machine for classroom or individual use which would present simultaneously visual and aural versions of the sequences developed in this project, would receive and evaluate pupil responses,[12] and would provide subsequent presentations of pre-recorded branching programs of instruction in singing concept formation and skill development; 5) a continuation and a stepping up of research on the song literature for elementary schools with special emphasis on songs for early childhood and songs for boys of all ages.

SUMMARY

This research discovered ways and means of helping children (and some adults) who have experienced failure in finding and learning to use their singing voices. The purposes of the project were to:

1) make an intensive study of the singing difficulties of elementary school children;
2) discover, observe and analyze successful techniques and materials for helping children who have not learned to "carry a tune";
3) develop a sequential remedial program for problem singers adaptable to a variety of song materials and to varied age levels;
4) try out the program in classrooms with music specialists and classroom teachers.

The project was based on the hypothesis that all normal school children can find and learn to use their singing voices with sufficient effectiveness to participate successfully and with satisfaction in singing activities. The project was also influenced by the belief that learning to sing is the first and most important step a child takes toward favorable musical experiences.

The project developers had other guiding principles or beliefs which influenced the structuring of the research. First of all, they believed that to insure workable applications of the research results to classroom practices in elementary music it (the research) should be classroom centered from start to finish. Second, they believed that the involvement of music specialists and classroom teachers in all phases of the research was required to achieve these workable applications. Third, they believed that group remedial experiences could be developed which would serve the dual purposes

of helping problem singers and improving the singing abilities and enjoyment of all elementary school children.

The project consisted of three phases of one year's duration each beginning July 1, 1965 and ending June 30, 1968. The first phase was a general orientation to the nature and causes of children's singing difficulties and a study of remedial methods and materials found to be successful by experienced teachers in alleviating these difficulties. The second phase was the development of pilot studies and case studies with remedial procedures and sequences using children who were having singing problems. The third phase was devoted to classroom experiments in public elementary schools. The central focus of all three phases was on the child who has difficulty in carrying a tune and in learning to use his singing voice.

During the first year the project staff visited many classrooms composed of children of various age levels and ethnic and economic backgrounds in a variety of geographic areas. An attempt was made to interview and to observe in action music specialists and classroom teachers who were successfully helping children who had singing difficulties. A nationwide survey of singing problems was made. For this summary the data obtained from the survey of incidence of inability to carry a tune might be of interest. Six hundred and two teachers reported the following incidence percentages in the classrooms they were teaching and supervising (although none reported complete elimination at any grade level of children who couldn't "carry a tune"):

PERCENTAGES OF THE INCIDENCE OF PROBLEM SINGERS
(Children Who Can't Carry a Tune)
CONTINUING THROUGH THE YEAR

1st grade - 34.6% problem singers
2nd grade - 24.2% problem singers
3rd grade - 17.8% problem singers
4th grade - 12.9% problem singers
5th grade - 11.8% problem singers
6th grade - 11.0% problem singers
all grades - 18.7% problem singers

The second phase of the study consisted of pilot studies in the elementary classrooms of the Western Campus Laboratory School. Case studies in selected public schools were developed also during this period to provide parallel activities to accompany the pilot studies. The pilot study groups established in the Laboratory School consisted of experimental and control groups in grades 1, 2, and 3. Each experimental group tested procedures and materials for helping children who were having difficulty in finding their singing voices. All children in both the experimental and control groups were given pre-tests and post-tests using the Gould Speech and Song Response Test which was developed especially for the project. Test results were compared with the results obtained from a panel of judges of before and after tape recordings of songs sung by the children of pilot experimental and control groups. Results of the case studies conducted in cooperating schools were measured with before and after tape recordings. These results were compared with results obtained from the pilot study groups.

From the activities of the second phase of the project definite patterns emerged in relation to techniques and materials to be used in group and individual singing activities to help problem singers find and use their singing voices. The third phase of the project consisted of experiments in classrooms of the public schools. These experiments used the sequences developed during the second phase of the study. The public school classrooms represented grades 1 to 6, numerous geographic areas, various sized school systems in urban and rural areas, and children of varying ethnic and economic backgrounds. Additional case study programs were implemented during this phase to provide comparisons with the classroom experiments and to try out approaches and materials not included in the prescribed experimental sequences.

Most important of the findings of the study was the establishment of the importance of kinesthetic factors in discovering and developing the singing voice. In other words, learning to carry a tune and sing was found to be a matter of learning how it feels to sing. In this regard, the study established two basic principles of learning to sing which seemed to hold true for all participating children (and adults): 1) to learn to sing the child must learn to hear his own voice in speaking and singing and to control high and low pitch levels in it; 2) he must experience unison with another voice or instrument and learn the sound and feeling of his voice as it matches pitches he hears.

In helping children learn to apply these principles several concepts and skills often had to be learned and drilled separately. For instance, the concept of highness and lowness of pitch in speaking and singing frequently had to be developed in a variety of ways involving both visual and tonal associations. The use of keyboard, bells, drawing melodies on the chalkboard, hand motions, dramatization of high and low pitch levels with movements of the entire body were but a few of the devices used in mastering this concept and skill.

Singing contrasted with speaking was another concept which often required drill before the child could use the skill involved consistently. Speech and song group activities included verses of songs, poems done in verse choir style, and commonplace conversational phrases such as, "This is my speaking voice!" and "This is my singing voice!"

The concept of singing quality was found to be closely allied to the concept of the singing voice as opposed to the speaking voice. To acquire this concept the child who had difficulty needed something more in the way of help than the experience of hearing other children or his teacher sing. There was some indication that concepts of pitch, range, and voice quality are all interrelated. Many children needed help in keeping their attention on their own voices. Closing one ear lobe and using the cupped hand to bring vocal sounds into focus and the sounds around them into the background helped develop skill in personal hearing and voice control.

The concept of unison was found to involve inner thinking of pitch as well as hearing pitch from a source outside the child. Many children, especially those with low speaking voices, acquired this concept most readily if tones for matching of pitch were presented at their natural speech levels even if the pitches were much lower than normal song ranges. That is, unison was first experienced by matching the tones from the source outside the child to the vocal sounds he could make whatever they might be.

Many children seemed to need much low voice training or training in their natural speaking ranges before they were successful in singing at the normal classroom range. It was only when they had learned to produce unisons accurately and consistently and to control their voices in simple melodic phrases pitched at their own normal speaking ranges that they could begin to make the transition to the higher tones or to tones outside this speaking range.

High voice training seemed to begin best with very short tonal patterns sung with the syllable o͞o. Pattern songs such as Yoo! Hoo![1] which called for an echo response from the problem singer in the newly found singing range were found in many of the recent elementary series. Typically children first acquired the ability to produce only the short pattern on the o͞o sound in the upper range. On the rest of the tones of the songs they might still be using the lower register. Gradually, however, this ability to produce these higher tones on the o͞o sound was expanded by using songs with longer echo patterns. Soon these children were able to sing entire songs on the o͞o syllable in the newly found range.

---

[1] Yoo! Hoo! is an adapted version of the song, Hoo! Hoo! from New Songs and Games by Ethel Crowninshield, Boston Music Co., 1941.

The transition from using the ōō syllable to using the words of songs, which followed, usually occurred rather quickly. Songs used in the pilot studies and classroom experiments to provide drill in making this transition were classified as Types A, B, or C according to the ~~skills~~ demanded of the child in matching the melodies.

Type A songs began on the low tonic and proceeded by scale steps up and down the major (or minor) scale in a short range of five or six tones. For many children the negotiation of a few scale steps from the tonic was then done in progressively higher keys.

Type B songs, which began on the 3rd or 5th, provided practice in starting a song which began on a tone other than the low tonic. These songs usually contained the interval of the descending minor third, perhaps beginning with it.

Type C songs contained one or more skips to the high tonic. They provided the improving singer with practice in negotiating the skip to a higher tone from a lower tone. This skill involved mental as well as physical preparation for the higher tone. Children often found it much easier to negotiate these longer interval skips using the ōō sound than with the actual words of the song. They were helped to sing the words on pitch accurately by first singing the ōō sound on the interval.

As the problem singer obtained skill in using his newly found voice in singing these types of songs with the words, he often needed some help with the problems of breathy quality and/or pinched quality. Many children and adults found vocalises and song melodies using Yah, Mah, and Nah (also other vowels) helpful in opening and freeing the voice at this stage of vocal development. Of great interest to the classroom teachers and music specialists involved in cooperating case studies and pilot studies of the project was the effect of group activities beamed toward problem singers in the regular elementary music classes on the average and good singers in these classes. Improvement in overall tone quality of the classes was generally noted.

The culminating activities of the project included the making of sound films and video tapes showing the problem singers learning to sing. A manual for elementary music teachers describing procedures of the study and containing song materials and speech and song activities is a part of the final report. An indication of the ultimate contribution of the project to elementary music programs was found in the participating classrooms of the project where every child had found his voice and sang with his peers using acceptable tone quality and intonation. Such classrooms were primarily vocally oriented.

Recommendations to music specialists and classroom teachers stressed the adaptability of the remedial sequence developed to the song materials of newly published elementary music series. Desirable improvement in the singing abilities of non-singing adults and older students was indicated by results of experiments conducted with college freshmen and graduate students.

Recommendations for future research included:

1) investigation of the vocal responses and potential for developing singing skills of mentally handicapped children;
2) studies of the growth of musicality through vocal responses of children who are deaf or have serious hearing loss;
3) studies of singing problems relating to physical handicaps of the vocal mechanism, such as nodules on the vocal cords and chronic throat and sinus disorders;
4) development of a teaching machine for classroom or individual use which would present simultaneously visual and aural versions of sequences developed in the study, would receive and evaluate pupil responses, and would provide subsequent presentations of pre-recorded branching programs of instruction in singing concept formation and skill development.

REFERENCES

1. An excellent discussion of ways of developing these habits is found in the Kindergarten Book of the Discovering Music Together series, Follett Publishing Company, 1968, p. 8.

2. Arthur G. Jersild and Sylvia Bienstock, "A Study of the Development of Children's Ability to Sing," Journal of Educational Psychology, 1934, pp. 481-503.

3. Pauline E. Gaiser, "A Study of Tone-Matching Techniques as Remedial Instruction for Non-Singers," Ed. D. Thesis, University of Oregon, 1961.

   Westervelt B. Romaine, "Developing Singers from Non-Singers," Ed. D. Thesis, Teachers College, Columbia University, 1961.

4. James S. McKenzie, "New Methods for Non-Singers.", Educational Music Magazine, March-April, 1948, pp. 20-21, 52-54. The author may have been the first to use the term, non-singer, and to include several categories of non-singing difficulties.

   James Mainwaring, "Psychological Factors in the Teaching of Music," British Journal of Educational Psychology, Vol. XXI, Part II, June, 1951, p. 109 and "Kinesthetic Factors in the Recall of Musical Experience" from Volume XXIII of the same publication, p. 34.

   Bruce Douglas Faulds, "The Perception of Pitch in Music," Ph. D. Thesis, Princeton University, 1959, 95 pp.

   Robert G. Petzold, "The Development of Auditory Perception of Musical Sounds by Children in the First Six Grades," Journal of Research in Music Education, Vol. XI, No. 1, Spring, 1963, pp. 28-30.

   Edith N. Drexler, "A Study of the Ability to Carry a Melody at the Pre-School Level," Child Development, Vol. IX, 1938, pp. 319-332.

   Ruth Updegraff and others, "The Effect of Training Upon the Singing Ability and Musical Interest of 3, 4 and 5 Year Old Children," University of Iowa Studies in Child Welfare, XIV, 1938, pp. 83-131.

5. James L. Mursell & Maybelle Glenn, Psychology of School Music Teaching, New York: Silver Burdett Co., 1938, 386 pp.

   Raymond Elliot, Teaching Music, Columbus, Ohio: C. E. Merrill Books, 1960, pp 25-31.

   Robert E. Nye and Vernice T. Nye, Music in the Elementary School, Englewood Cliffs, N. J.: Prentice-Hall, 1957, p. 98.

Parks Grant, *Music for Elementary Teachers*, 2nd Ed., New York: Appleton-Century-Crofts, 1960, p. 106 ff.

Bessie R. Swanson, *Music in the Education of Children*, San Francisco: Wadsworth Pub. Co., 1961, 292 pp.

Irene Hissen, *A New Approach to Music for Young Children*, Child Development, Vol. IV, 1933, pp. 308-317.

Anne E. Pierce, *Teaching Music in the Elementary School*, New York: Holt, Rinehart and Winston, Inc., 1959, 239 pp.

Louise K. Myers, *Teaching Children Music in the Elementary School*, Englewood Cliffs, N. J.: Prentice Hall, 1956, 374 pp.

6. The Gould Speech and Song Response Test is an unpublished tape recorded test developed for this project. See Appendix B 2.

7. An experimental primary version of the *Gordon Aptitude Profile*, Houghton, Miflin and Co.

8. This term was suggested by Charles Leonhard and is used in the discussion for teachers in the Kindergarten Book referred to in Reference No. 1.

9. This song, found in several new collections of children's songs, is by Ethel Crowinshield. It's original version is found in *New Songs and Games*, Boston Music Co., 1941.

10. Marilyn Stanley Humpherys, "The Out-of-Tune Singer of the College Level: Twenty Case Studies," M.A. Thesis, Brigham Young University, 1967. p.25.

11. Raymond Elliot states these principles in *Teaching Music* referred to in Reference 4.

12. A. D. Sypherd and N. D. Salman, *Automatic Laser Encoding of Semiconductor Read-Only Memories*, Anaheim, California: Autonetics Division of North American Rockwell Corporation, 1968, 2 - 4. See also: Wolfgang E. Kuhn and Raymond L. Alvin, "Computer Assisted Teaching: A New Approach," *Journal of Research in Music Education*, Vol. XV, Winter 1967, pp. 305-315.

BIBLIOGRAPHY

Boardman, Eunice L., "An Investigation of the Effect of Preschool Training on the Development of Vocal Accuracy," Ed.D. Thesis, University of Illinois, 1964.

Buckley, Isabelle P., College Begins at Two, New York: Whiteside, Inc., 1965.

Bugg, Eugene and Herper, Lloyd, "The Significance of Tonal Memory for Musicality," Journal of General Psychology, Vol. 35, July 1946, 3-15.

Burgess, Evangeline, Values in Early Childhood Education, Washington, D.C., NEA Dept. of Elementary-Kindergarten-Nursery Education, 1965.

Clegg, Beth Wardell, "A Comparative Study of Primary Grade Children's Ability to Match Tones," Unpublished master's thesis, Brigham Young University, 1966.

Corrigan, Gertrude, "Monotones," American Childhood, January, 1944, 21-22.

Culpepper, Leon R., "A Study of the Hearing Impariments in Defective Singers," Unpublished doctoral dissertation, George Peabody College for Teachers, 1961.

Frosdham, Olaf M., "What Is the Child's Natural Voice Range?" Music Educator's Journal, January, 1955, 54-56.

Gaiser, Paulene Ellen, "A Study of Tone Matching Techniques as Remedial Instruction for Non-Singers," Unpublished dissertation, University of Oregon, 1961.

Gardner, Bruce D., Development in Early Childhood, The Preschool Years, New York: Harper and Row, 1964.

Gaston, E. Thayer, "Motor-Visual Imagery in Tonal Thinking," Music Educator's Journal, February, 1940, 23, 79-81.

Gould, A. Oren, Developing Specialized Programs for Singing in the Elementary School, Interim Report No. 1, U.S.O.E. Project No. 5-0241, Contract No. DE10-6-016, Washington D.C., 1966.

______, Developing Specialized Programs for Singing in the Elementary School, Interim Report No. 2, Washington, D. C., 1967.

______, "Developing Specialized Programs for Singing in the Elementary School," Bulletin of the Council for Research in Music Education, Vol. 6, Fall 1965, 17-24.

______, Finding and Learning to Use the Singing Voice, A Manual for Teachers, Western Illinois University, Macomb, Illinois, 1968.

Hammer, Harry, "An Experimental Study of the Use of the Tachistoscope in the Teaching of Melodic Sight Singing," Journal of Research in Music Education, Vol. XI, No. 1, Spring 1963, 44-54.

Hatwick, Melvin S., "The Role of Pitch Level and Pitch Range in the Singing of Pre-School, First Grade, and Second Grade Children," Child Development, Vol. IV, 1933, 281-291.

Humpherys, Marilyn Stanley, "The Out-Of-Tune Singer at the College Level: Twenty Case Studies," Unpublished masters thesis, Brigham Young University, 1967.

Hutt, Max L. and Gibby, Robert Gwyn, The Child Development and Adjustment, Boston: Allyn and Bacon, Inc., 1959.

Ingram, Madeline D. and William C. Rice, Vocal Technique for Children and Youth, Nashville: Abingdon Press, 1962.

Jackson, Grace Rogers, "No Child is Tone Deaf," Parent's Magazine, August, 1940. 22,35,42.

Jeffrey, Wendell E., "Variables in Early Discrimination Learning: II Mode of Response and Stimulus Difference in the Discrimination of Tonal Frequencies," Child Development, No. 4, December, 1958, 531-538.

Jersild, Arthur T. and Bienstock, Sylvia, "A Study of the Development of Children's Ability to Sing," Journal of Educational Psychology, 1934, pp. 481-503.

Kelsey, F., "What is Singing," Music and Letters, Vol. 30, July 1949, 216-230.

Kirkpatrick, William Coy, Jr., "Relationships Between the Singing Ability of Pre-kindergarten Children and Their Environment," Ed.D. Thesis, University of Southern California, 1962.

Miessner, W. Otto. "The Art of Tonal Thinking," Music Educator's Journal, January, 1962, 42-45.

Moorhead, Gladys E. and Pond, Donald, Music for Young Children, Vol. II, Pillsbury Foundation for Advancement of Musical Education, 1942, 3.

Murphy, Lois and others, The Widening World of Childhood, New York: Basic Books, Inc., 1962.

Neiswender, Charles, "Is It Too Late to Teach All Children to Sing?" Music Educator's Journal, September-October, 1954, 33-34.

Ortmann, Otto, "Some Tonal Determinants of Melodic Memory," Journal of Educational Psychology, Vol. 24, September, 1933, 454-467.

______. "What is Tone Quality?" Musical Quarterly, Vol. 31. 1935.

Petzold, Robert, Auditory Preception of Musical Sounds By Children In the First Six Grades, Madison, Wisconsin: Cooperative Research Project No. 1051, The University of Wisconsin, 1966.

Reuter, Georgia Sue, "Remedial Treatment of Inaccurate Singers," Educational Music Magazine, March-April, 1956, 41-45.

Romaine, Westervelt B., "Developing Singers from Non-singers," Ed.D. Thesis, Teachers College, Columbia University, 1961.

Sheldon, John M., "Prediction of Success in Pitch Reproduction for the Non-music Major in College," Ph.D. Thesis, University of Southern California, 1964.

Smith, Franklin L., "The Effect of Training on Pitch Discrimination," The Psychological Monograph, University of Iowa Studies, Vol. XVII, No. 3, June 1914, 69.

Smith, Robert B., "A Study of the Effects of Large Group Vocal Training on the Singing Ability of Nursery School Children," Unpublished doctoral dissertation, University of Illinois, 1961.

Stott, Leland H., Child Development, An Individual Longitudinal Approach, New York: Holt, Rinehart and Winston, Inc., 1967.

Updegroff, Ruth; Heiliger, Louise; and Learned, Janet, "The Effect of Training Upon the Singing Ability and Musical Interest of 3, 4 and 5-Year Old Children," University of Iowa Studies in Child Welfare, Vol. 14, 1938, 83-131.

Westerman, Kenneth N., Emergent Voice, Ann Arbor, Michigan: Carol F. Westerman, Box 62.

Wyatt, Ruth F., "Improvability of Pitch Discrimination," Psychological Monographs, 1945, No. 2.

APPENDIX A

1. PROJECT STAFF

DIRECTOR:	A. Oren Gould, Ed.D.	Professor of Music Education Western Illinois University Macomb, Illinois
ELEMENTARY MUSIC CONSULTANT:	Judith L. Wright	Campus School Western Illinois University Macomb, Illinois
RESEARCH SECRETARY:	Dorothea E. Winter	Music Research Office Campus School Room 135 Western Illinois University Macomb, Illinois 61455
FINANCIAL OFFICER:	Herman R. Koester	Treasurer, Research Council Western Illinois University Macomb, Illinois
PROJECT OFFICER:	Harold Arberg, Ed.D.	United States Office of Education Arts and Humanities Division
PROJECT CONSULTANTS:	Wayne Wiggins, Ed.D	Western Illinois University Macomb, Illinois
	Dorothea Blyler, Ed.D.	Western Illinois University Macomb, Illinois
	Forrest Wanninger, Ph.D.	Western Illinois University Macomb, Illinois
	Charles Leonhard, Ed.D.	University of Illinois Urbana, Illinois
	Richard Colwell, Ed.D.	University of Illinois Urbana, Illinois
	Hazel B. Morgan, Ph.D.	Claremont Graduate School Claremont, California
	John Sheldon, Ph.D.	San Diego State College San Diego, California
	Westervelt Romaine, Ed.D.	Fairfax Public Schools Fairfax, Virginia
	Robert B. Smith	University of Illinois Urbana, Illinois
	Edna M. Hehn	Oakland Public Schools Oakland, California

APPENDIX A

2. COOPERATING PUBLIC SCHOOLS PERSONNEL

1. Cleveland, Ohio:

   Music Consultant: Ruth Shane
   Music Supervisor: Helen Socolofsky
   Directing Supervisor of Music: Robert Rimer
   Principal of Fulton School: Jean Cassel

2. Geneseo, Illinois:

   Music Supervisor: Marjorie Carlson
   Cooperating Teachers: Mrs. Raymond Pobanz, Joyce King, Georgian Botruff, Mrs. J. W. Todd
   Director of Curriculum: Hugh Fuqua
   Superintendent of Schools: John V. Phleger

3. Macomb, Illinois:

   Music Consultant: Joanne Findley
   Music Supervisor: Ruth Parks
   Cooperating Teachers: Mildred Clark, Lorene Jackson
   Principal of Logan School: Viletta Hilary
   Superintendent of Schools: P. F. Shafer

4. Oakland, California:

   Supervisor: Edna M. Hehn
   Assisting Music Consultants: Juanita Carr, Barbara Dunlap, Ruth Cooper, Tamar Halpin, Virginia Haynes, Nancy Bushnell Avis Prentice
   Assistant Superintendent of Schools: Dr. Edward F. Cockrum

5. Princeton, Illinois:

   Music Supervisor: Peggy La Rowe
   Cooperating Teachers: Elizabeth Smith, Rebecca Campbell
   Principal of Washington School: Mrs. John Zink
   Superintendent of Schools: Clarence Haysenyager

6. Quincy, Illinois:

   Director of Music: Dale Kimpton
   Music Consultants: Marjorie Ahlstrand, Rinella Pribble, Mary Ellen McNeil
   Cooperating Teachers: Marilyn Jacobs, Betty Bernzan, Ann Snodgrass, Evelyn Cook, Cornelia Wand, Mrs. Sula, Mr. Tucker, Mr. Brown
   Principal of Irving School: Keith Smith
   Principal of Emerson School: Walter Blunt
   Principal of Dewey School: L. C. Current
   Assistant Superintendent of Schools: Dr. Robert Meyer

7. San Diego State College:

Associate Professor of Music: Dr. John Sheldon

8. Alanton School, Virginia Beach, Virginia:

Music Consultant: Mrs. Irene Korte
Cooperating Teacher: Mrs. J. Taylor
Director of Research: Dr. Robert Kelly

9. Grand Rapids, Michigan:

Music Consultant: Doris James
Assisting Music Consultants: June Nelson, Carolyn Peterson, Albertha Kuiper
Principal of Vandenburg School: Clabeon Coleman
Principal of Campau Park School: Ross DeHahn
Principal of Coldbrook School: Veva Jaquith
Principal of Lexington School: Vera Hinckley
Director of Elementary Schools: Ina Loveall

10. Western Laboratory Schools:

Music Consultant: Judith Wright
Cooperating Teachers: Jessie Lewis, Helen Johnson, Dr. Doris Leighty, Eleanor Gingerich, Barbara Kowal, Maryon Howell
Principal: H. Waldo Horrabin
Curriculum Coordinator: Dr. L. Donald Hahn
Dean of School of Education: Dr. F. P. Abel

11. Ricks College, Rexburg, Idaho:

Professor of Voice: Marilyn Humpherys

APPENDIX B

1. SURVEY OF INCIDENCE, CAUSES, AND REMEDIAL TECHNIQUES FOR NON-SINGERS PROBLEMS IN THE ELEMENTARY SCHOOL

(Please refer to the accompanying letter before completing.)

I. Check the term you prefer to use in referring to non-singers:

a. Uncertain singer ______
b. Out of tune singer ______
c. Non-singer ______
d. Monotone ______
e. Other ______

II. Check the phrases which best describe the non-singing child. (Check as many as you find appropriate.)

a. Does not carry a tune but may match some tones ....______
b. Does not carry the tune or match any tones, but sings the "Shape" of the melody ....______
c. Sings on one tone off key all of the time ....______
d. Sings the tune correctly in a low key but cannot match tones at the pitch level of the rest of the class ....______
e. Voice wanders with no regard for pitches or the "shape of the melody ....______
f. Other (exclude organic difficulties) ______________________________
____ ....______

III. In your experience, what percentage of children at each grade level, on an average, have non-singing difficulties of some sort?

a. 1st grade ______%
b. 2nd grade ______%
c. 3rd grade ______%
d. 4th grade ______%
e. 5th grade ______%
f. 6th grade ______%

IV. In your opinion, what are the causes of non-singing difficulties? (Check as many as you consider applicable.)

a. Lack of musical background resulting in inattention to pitch and failure to recognize pitch changes. ______
b. Lack of maturity resulting in failure to find the singing voice and to coordinate vocal muscles with pitches heard. ______
c. Low speaking voice resulting in discomfort in matching tones at the level demanded by the teacher and class. ______
d. Psychological inhibition toward singing caused by attitudes of peers and adults reacting to the child's unsuccessful attempts to sing. ______
e. Other (exclude organic difficulties) ______________________________
____
f. Other ____

V. In your opinion, can all children be helped? Yes ______ No ______
Please explain. (Use other paper if needed.)

VI. Please check the grade level at which children can be helped most readily. (Check as many as are applicable.)

a. 1st grade ______
b. 2nd grade ______
c. 3rd grade ______
d. 4th grade ______
e. 5th grade ______
f. 6th grade ______

VII. Please use this space to describe remedial techniques which you have found helpful.

VIII. Would you be interested in cooperating in some phase of the study of non-singing problems outlined in the accompanying letter? Yes ______ No ______

IX. Your name ____________________ Position ____________________

Your institution ____________________ City ______________ State ________

Your mailing address ____________________ Office phone ______________

NOTE: If for any reason you do not wish to complete this questionnaire, will you pass it on to someone else who will be interested in returning it to me.

APPENDIX B

2. GOULD SPEECH AND SONG RESPONSE TEST

Total Possible Score: 318 Points

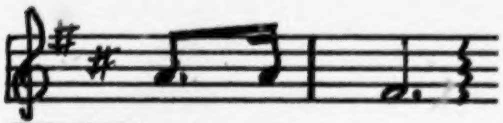
I. Teacher: I AM GOING TO SAY SOME THINGS AND WANT YOU TO REPEAT THEM AFTER ME. IF MY VOICE GOES UP, MAKE YOUR VOICE GO UP; IF MY VOICE GOES DOWN, MAKE YOUR VOICE GO DOWN. WHEN I SAY, "NOW YOU", IT IS YOUR TURN.

1.	Number 1:	Hel ↗ lo! (Now you...)	Child:	Hel ↗ lo!
2.	Number 2:	Hel ↘ lo! (Now you...)	Child:	Hel ↘ lo!
3.	Number 3:	How ↘ are ↗ you? (Now you...)	Child:	How ↘ are ↗ you?
4.	Number 4:	How ↗ are ↘ you? (Now you...)	Child:	How ↗ are ↘ you?

Score 2 points for each correct voice direction
Total Points: 12

II. Teacher: NOW I AM GOING TO SAY SOME PHRASES AND SING SOME PHRASES. IF I SAY THEM, I WANT YOU TO SAY THEM; IF I SING THEM, I WANT YOU TO SING THEM. MAKE YOUR VOICE GO UP AND DOWN AS I DO. WHEN I SAY, "NOW YOU", IT IS YOUR TURN.

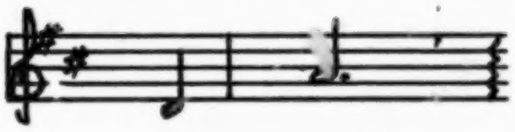
1.	Number 1:	What's your ↗ name? (Now you...)	Child:	Same (2 points)
2.	Number 2:		Child:	Same (6 points)



(Now you...)

John.
3. Number 3: I'm ↗ Child: Same (2 points)
(Now you...)

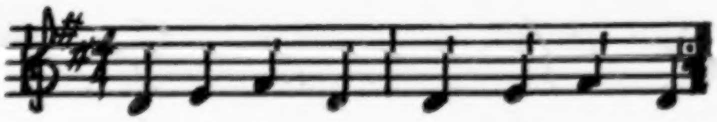
4. Number Child: Same (4 points)



(Now you...)

sleep
sleep ↘
5. Number 5: you ↗ ing, Child: Same (12 points)
you ing?
Are ↗
Are
(Now you...)

6. Number 6:



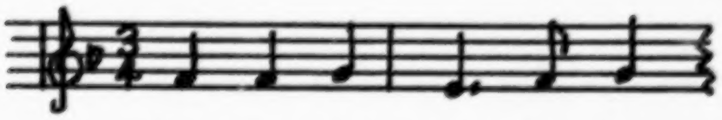
Are you sleep-ing, Are you sleep-ing?

(Now you...)

Score as marked, subtracting 1 point for each pitch missed
and 1 point for each voice direction missed.
Total Points: 42

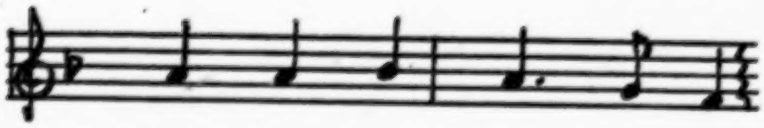
III. Teacher: NOW I AM GOING TO SING SOME MELODIC PHRASES USING THE SYLLABLE LO͞O. WHEN I SAY, "NOW YOU," SING EXACTLY WHAT I SANG USING LO͞O.

1a. 1a. Child: Same (12 points)



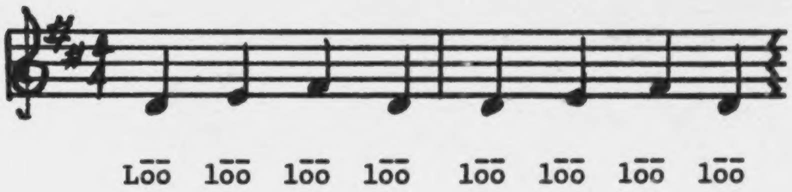
LO͞O lo͞o lo͞o lo͞o lo͞o lo͞o

1b. 1b. Child: Same (12 points)



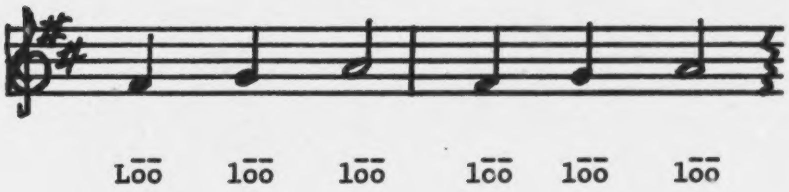
LO͞O LO͞O LO͞O lo͞o lo͞o lo͞o

2a.


Loo loo loo loo loo loo loo loo

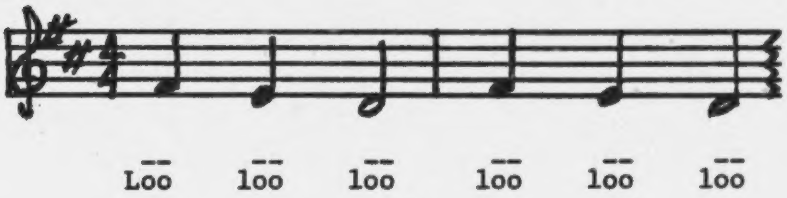
2a. Child: Same (16 points)

2b.


Loo loo loo loo loo loo

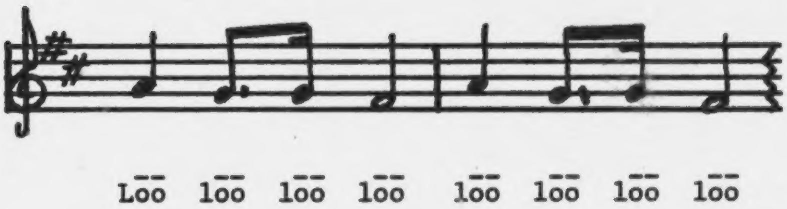
2b. Child: Same (12 points)

3a.


Loo loo loo loo loo loo

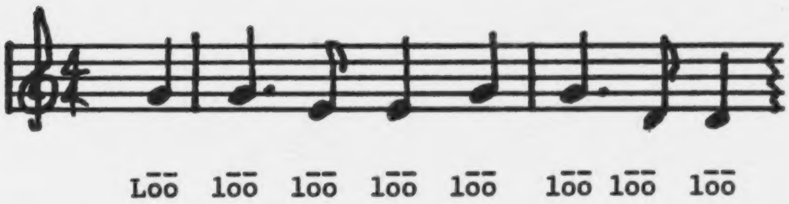
3a. Child: Same (12 points)

3b.


Loo loo loo loo loo loo loo loo

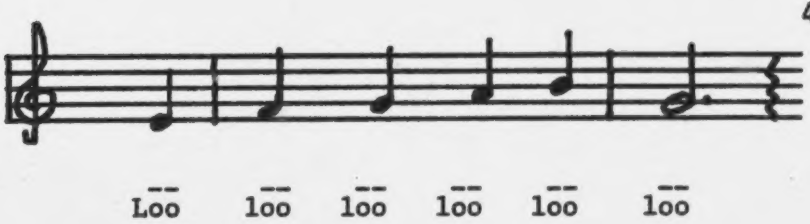
3b. Child: Same (16 points)

4a.


Loo loo loo loo loo loo loo loo

4a. Child: Same (16 points)

4b.


Loo loo loo loo loo loo

4b. Child: Same (12 points)

Subtract 1 point for each pitch missed and 1 point for each voice direction missed.
Total Points: 108

IV. **Teacher:** NOW I AM GOING TO SING THE VERY SAME PHRASES WITH THE WORDS. WHEN I SAY, "NOW YOU WITH ME," I WANT YOU TO SING EACH PHRASE WITH ME AS I SING IT AGAIN.

1a. Same

My coun - try 'tis of thee

1a. Child: Same (12 points)

1b. Same

Sweet land of lib - er - ty.

1b. Child: Same (12 points)

2a. Same

Are you sleep - ing, are you sleep-ing?

2a. Child: Same (16 points)

2b. Same

Broth - er John, broth - er John.

2b. Child: Same (12 points)

3a. Same

Three blind mice, three blind mice

3a. Child: Same (12 points)

3b. Same

See how they run, See how they run!

3b. Child: Same (16 points)

4a. Same 4a. Child: Same (16 points)

O beaut - i - ful for spac-ious skies

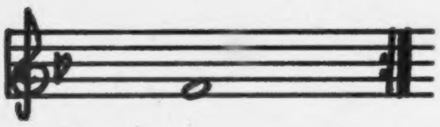
4b. Same 4b. Child: Same (12 points)

For Am - ber waves of grain.

Subtract 1 point for each pitch missed and 1 point for each voice direction missed.
Total points: 108

V.a. Teacher: NOW I AM GOING TO SING SOME INDIVIDUAL TONES WITH LOO. YOU WILL HEAR EACH TONE TWICE. WHEN I SAY, "NOW YOU," SING EXACTLY THE SAME PITCH WITH LOO.

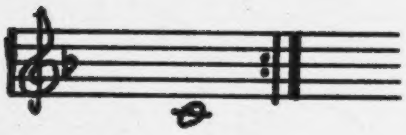
1a.



Loo

1a. Child: Same (2 points)

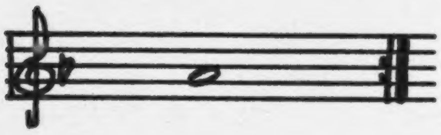
2a.



Loo

2a. Child: Same (2 points)

3a.

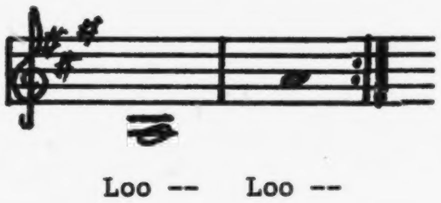


Loo

3a. Child: Same (2 points)

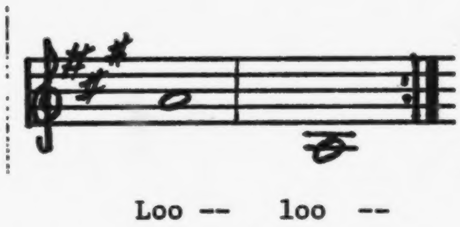
NOW I AM GOING TO SING TWO TONES AND WANT YOU TO DO THE SAME.

4a.



4a. Child: Same (4 points)

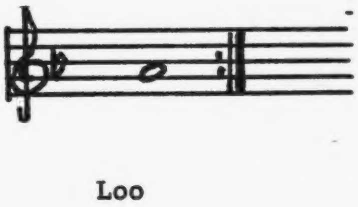
5a.



5a. Child: Same (4 points)

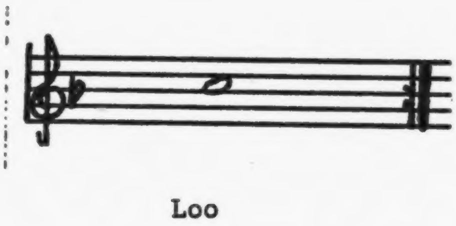
Vb. NOW I AM GOING TO SING SOME HIGHER TONES. WHEN I SAY, "NOW YOU", PLEASE SING EXACTLY THE SAME TONES USING YOUR HIGHER VOICE.

1b.



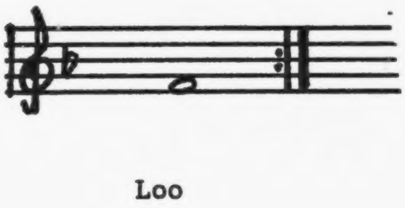
1b. Child: Same (2 points)

2b.



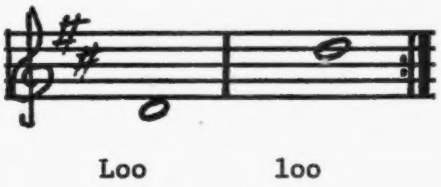
2b. Child: Same (2 points)

3b.



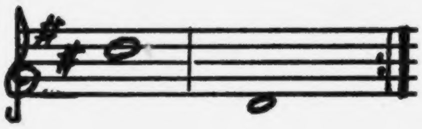
3b. Child: Same (2 points)

4b.



4b. Child: Same (4 points)

5b.

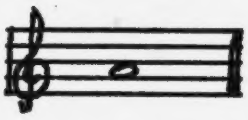


5b. Child: Same (4 points)

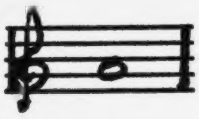
Subtract 2 points for each pitch missed except for the 2 tone patterns on which subtract 1 tone for each pitch and 1 point for each voice direction missed.

Total Points: 28 .

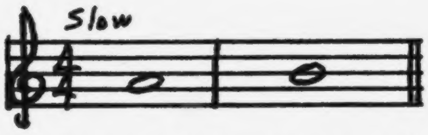
VI. Teacher: NOW I AM GOING TO PLAY SOME TONES ON THE PIANO. FIRST YOU WILL HEAR THE HOME TONE



THEN YOU WILL HEAR THE HOME TONE AND ONE OR MORE OTHER TONES. YOU ARE TO TELL WHETHER THE OTHER TONES ARE HIGHER, LOWER OR SAME AS THE HOME TONE. LISTEN AGAIN TO THE HOME TONE:



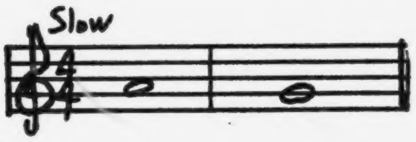
1. NOW FOR NUMBER 1.



IS IT HIGHER, LOWER OR SAME AS THE HOME TONE?

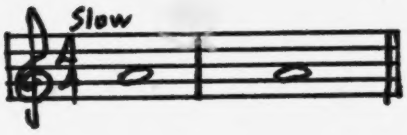
1. Child Answers or writes. (2 points)

2.



2. Child Answers or Writes. (2 points)

3.

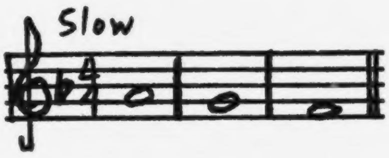


3. Child Answers or Writes. (2 points)

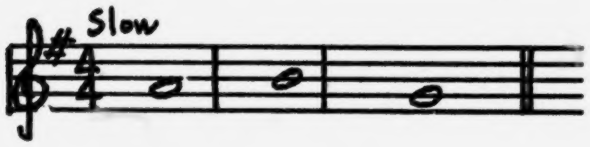
NOW WE HAVE 2 TONES AFTER THE HOME TONE.

4.

4. Child Answers or Writes. (4 points)



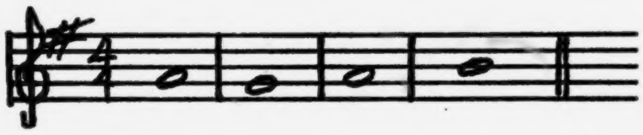
5.



5. Child: Answers or Writes
(4 points)

NOW THERE ARE THREE TONES AFTER THE HOME TONE.

6.



6. Child: Answers of Writes
(6 points)

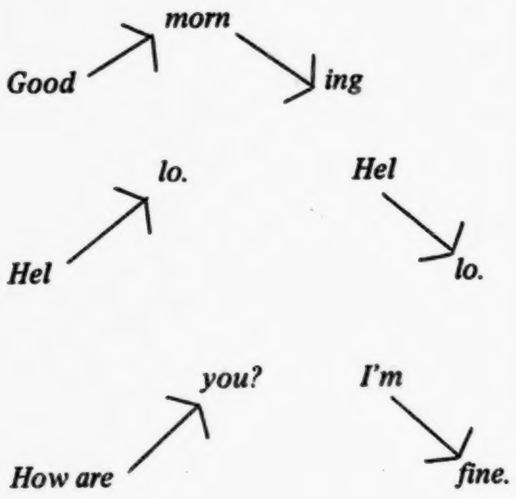
Subtract 2 points for each incorrect answer.

Total Points: 20

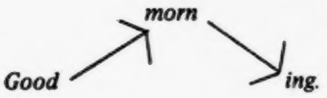
Scoring the test. Deduct one point for each pitch direction missed and one point for each pitch not matched correctly in phrases and patterns which are sung. Count 2 points off for pitch direction missed in speech activities, 2 points off for each pitch missed in pitch matching section and 2 points off for each incorrect answer in the pitch judgment section. Subtract total missed from 318 for raw score.

APPENDIX C

1. Speech Activities:

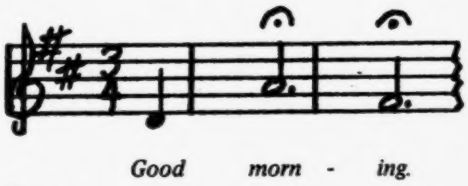

Good
morn
ing
Hel
lo.
Hel
lo.
How are
you?
I'm
fine.

Teacher (spoken):


Good
morn
ing.

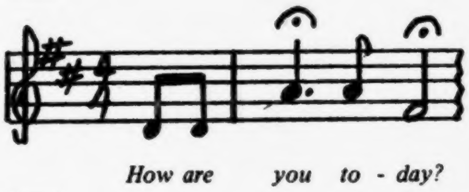
Children (spoken): Same

Teacher (sung):


Good morn - ing.

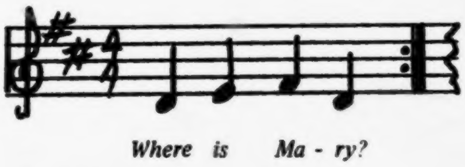
Children (sung): Same

Teacher (sung):

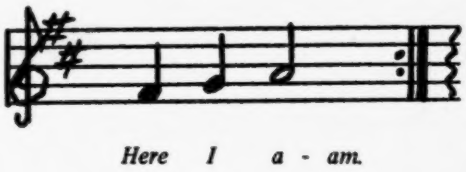

How are you to - day?

Children (sung): Same

Teacher (sung):


Where is Ma - ry?

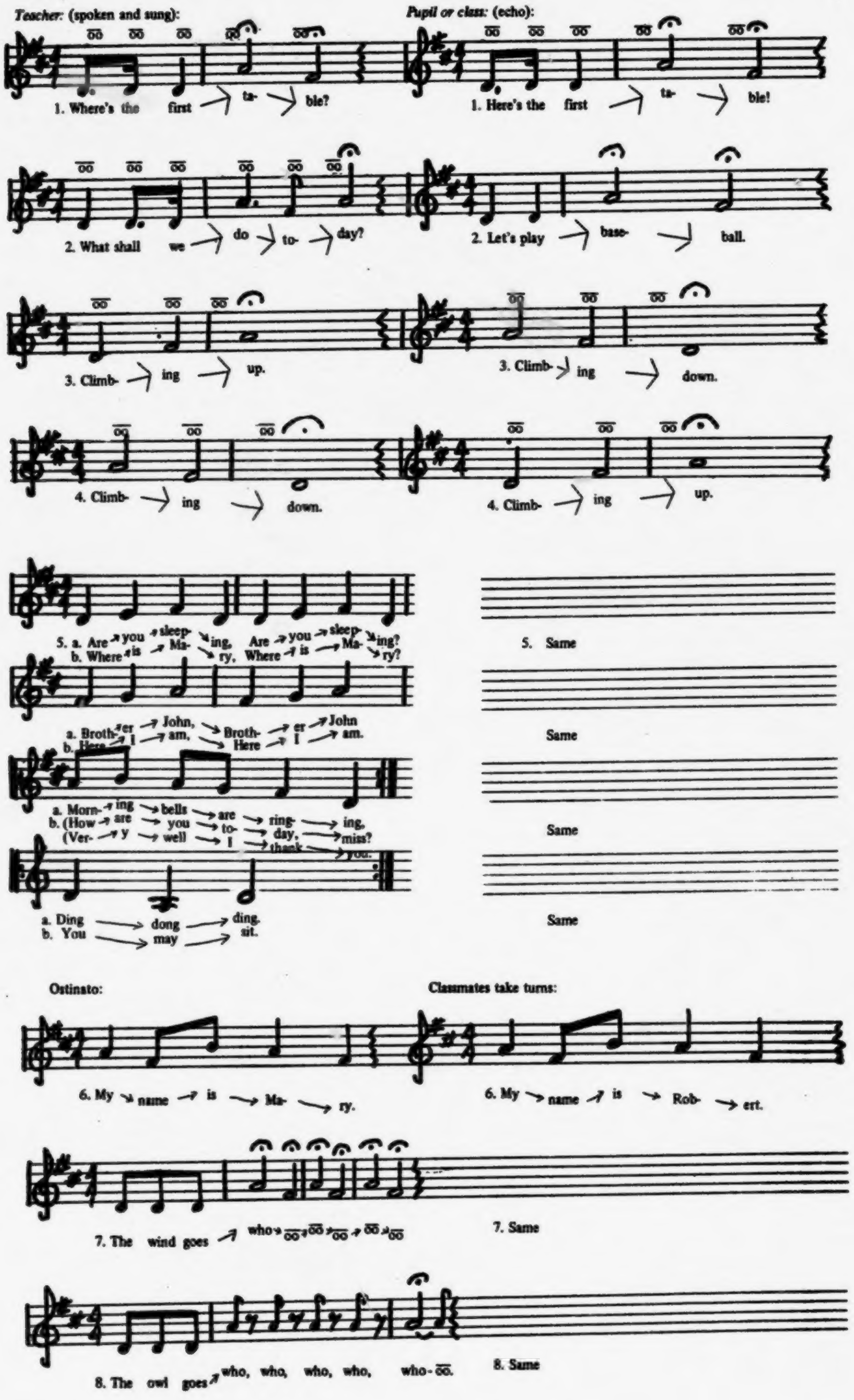
Children (sung):



Teacher: *Let me hear your different kinds of voices. First listen to me. "This is my whispering voice."*
Children (whispering): *"This is my whispering voice".*
Teacher (talking): *"This is my talking voice".*
Children (talking): *"This is my talking voice".*
Teacher (yelling): *"This is my yelling voice".*
Children (yelling): *"This is my yelling voice".*
Teacher (singing or sing-song): *"This is my singing voice".*
Children (singing or sing-song): *"This is my singing voice".*

Use poems, verses of songs, nursery rhymes.

2. Speech to Song Activities:


Teacher: (spoken and sung):
Pupil or class: (echo):
1. Where's the first ta- ble?
1. Here's the first ta- ble!
2. What shall we do to- day?
2. Let's play base- ball.
3. Climb- ing up.
3. Climb- ing down.
4. Climb- ing down.
4. Climb- ing up.
5. a. Are you sleep- ing, Are you sleep- ing?
b. Where is Ma- ry, Where is Ma- ry?
5. Same
a. Broth- er John, Broth- er John
b. Here I am, Here I am.
Same
a. Morn- ing bells are ring- ing,
b. (How are you to- day, miss?
(Ver- y well I thank you.
Same
a. Ding dong ding.
b. You may sit.
Same
Ostinato:
Classmates take turns:
6. My name is Ma- ry.
6. My name is Rob- ert.
7. The wind goes who oo oo oo oo oo
7. Same
8. The owl goes who, who, who, who, who- oo.
8. Same

3. Pattern Songs:

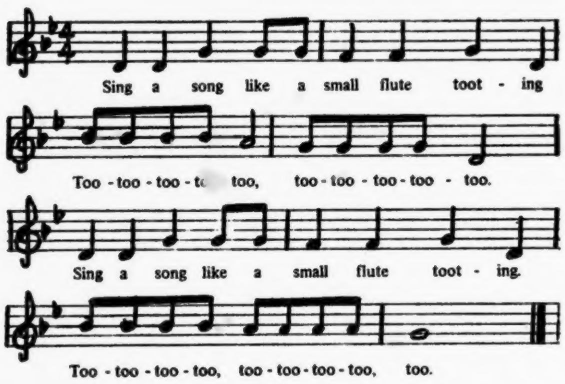
YOO HOO!

Words and melody by Ethel Crowninshield
Adapted by A. Oren Gould

From NEW SONGS AND GAMES by Ethel Crowninshield
copyright, 1941
Used by permission of Boston Music Co., copyright owners

The Flute Song

Jewish Folk Tune
Adapted by A. Oren Gould


Sing a song like a small flute toot - ing
Too - too - too - t too, too - too - too - too - too.
Sing a song like a small flute toot - ing.
Too - too - too - too, too - too - too - too, too.

SUGGESTED PATTERN SONGS

(a) Songs with two tone patterns
(b) Songs with expanded tonal patterns
suitable for using the ōō sound.

Growing With Music, Book 1
Prentice-Hall

Little Red Caboose (b)	page 22
Make A Sound (b)	page 24
Once a Birdie Came a Flying (b)	page 27
Riding in a Buggy (b)	page 42
Six Little Ducks (b)	page 16

Discovering Music Together, Book 1
Follett Publishing Company

Lazy Mary (a) (Use bell pattern)	page 21

Making Music Your Own, Kindergarten

Fray Martin (a)	page 63

Making Music Your Own, Book 2
-Silver Burdett Company

Bounce High, Bounce Low (b)	page 43
Sommer, Ade! (b)	page 4
The Bed (a) (Refrain)	page 124

The Magic of Music BOOK 1
Ginn and Company

Have You Heard the Wind (a)	page 48

Type A Songs:

My Little Ducklings

Austrian Folk Song

---

[2] From *Discovering Music Together*, Book I, Chicago: Follett Publishing Co., Page 35. Used by permission.

SUGGESTED TYPE A SONGS

Songs with ascending and descending scale steps.

Growing With Music, Book 1
Prentice-Hall

Count Your Buttons	page 32
Five Fat Turkeys	page 51
Leo the Lion	page 49
One Man Went to Mow	page 44
Our Flag	page 51

Discovering Music Together, Book 1
Follett Publishing Co.

Hot Cross Buns	page 9
Jack and Jill	page 47
Little Robin Redbreast	page 12
My Little Cats	page 32
The Bells	page 18
Three Blind Mice	page 36
Wind and Rain	page 13

Exploring Music, Kindergarten
Holt, Rhinehart and Winston, Inc.

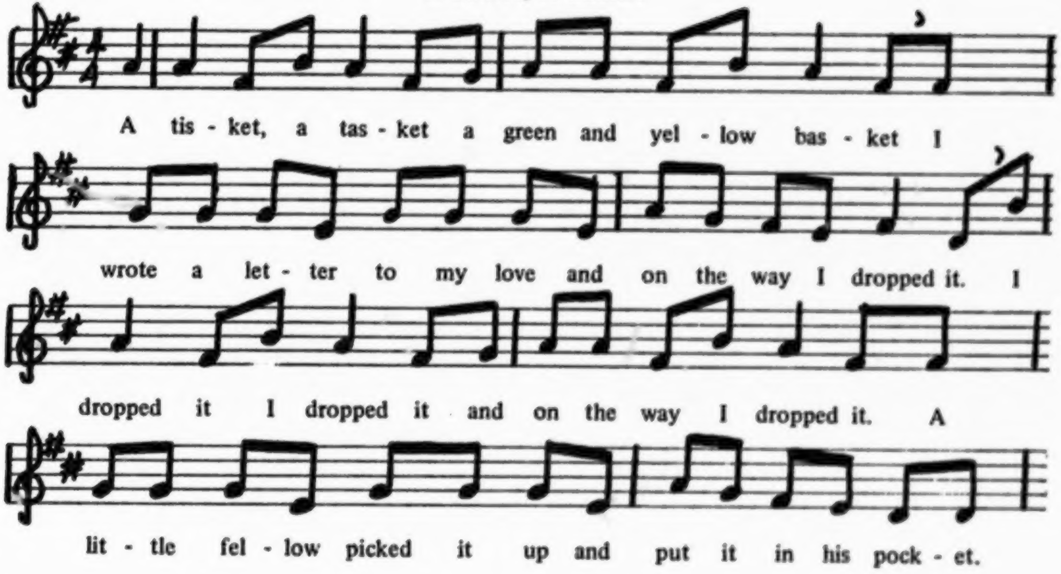
Getting Acquainted	page 24
Taffy	page 32

Exploring Music, Book 1
Holt, Rhinehart and Winston, Inc.

Sho-heen Sho	page 16

5. Type B Songs:

A Tisket, A Tasket


A tis - ket, a tas - ket a green and yel - low bas - ket I
wrote a let - ter to my love and on the way I dropped it. I
dropped it I dropped it and on the way I dropped it. A
lit - tle fel - low picked it up and put it in his pock - et.

SUGGESTED TYPE B SONGS

Songs beginning on the 3rd or 5th of the scale and usually containing the descending minor 3rd.

***Growing With Music*, Book 1**
Prentice Hall

Happy Birthday	**page 54**
Oh, Come Little Children	**page 52**

***Discovering Music Together*, Book 1**
Follett Publishing Company

Evening at Home	**page 51**
Hey, Diddle, Diddle	**page 48**
Spanish Counting Song	**page 27**
Tick-Tock	**page 11**

***Exploring Music*, Book 1**
Holt, Rhinehart and Winston, Inc.

Bright Stars	**page 34**
It's Raining	**page 22**
Pussy Cat	**page 28**

***Making Music Your Own*, Book 2**
Silver Burdett Company

Marching to Pretoria	**page 116**
Winter, Ade!	**page 99**

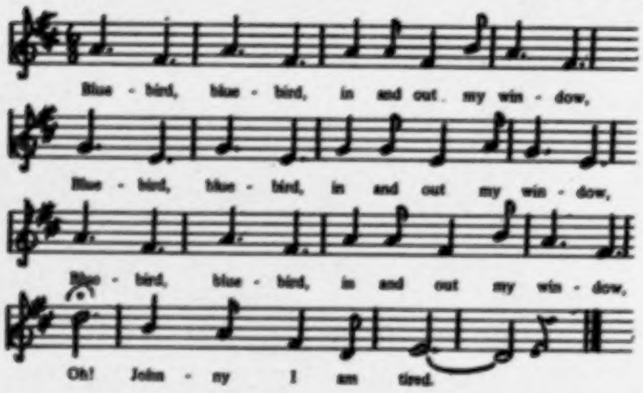
***The Magic of Music*, Book 2**

Jingle at the Windows	**page 154**
Skip to My Lou	**page 152**

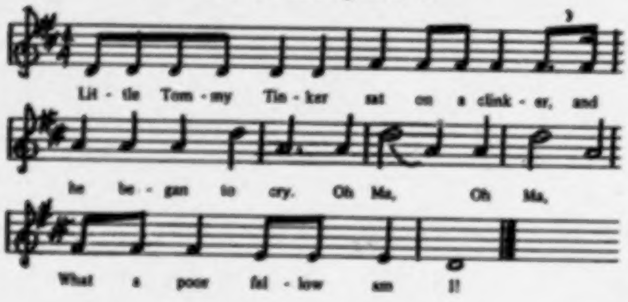
6. Type C Songs:

Bluebird

Singing Game
Adapted by A. O. G.


Blue - bird, blue - bird, in and out my win - dow,
Blue - bird, blue - bird, in and out my win - dow,
Blue - bird, blue - bird, in and out my win - dow,
Oh! John - ny I am tired.

Little Tommy Tinker


Lit - tle Tom - my Tin - ker sat on a clink - er, and
he be - gan to cry. Oh Ma, Oh Ma,
What a poor fel - low am I!

SUGGESTED TYPE C SONGS

Songs containing a skip to a high tone.

***Growing with Music*, Book 1**
Prentice-Hall

Blue Bird	page 35
Hello Everybody	page 1
Jeremiah, Blow the Fire	page 35
Valentines Red	page 55

***Discovering Music Together*, Book 1**
Follett Publishing Company

America the Beautiful	page 57
How D'Ye Do, My Partner	page 40
Off to School	page 7
Rubber Ball	Page 42

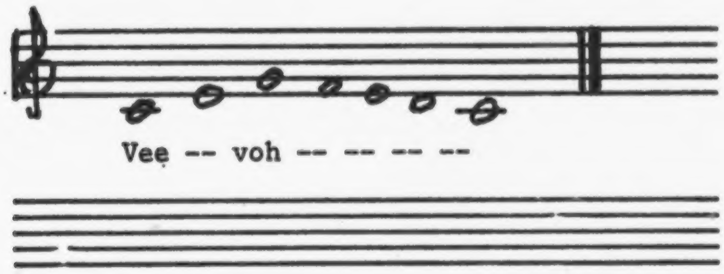
***Exploring Music*, Book 1**
Holt, Rinehart and Winston, Inc.

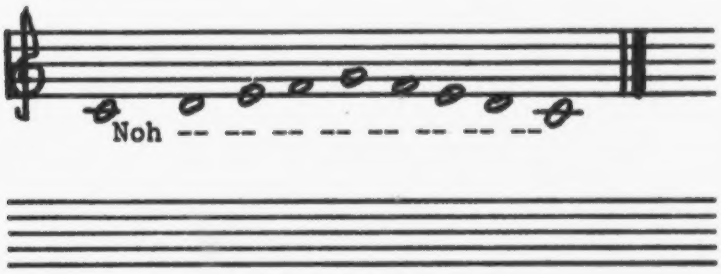
Hot Cross Buns (New Melody)	page 39

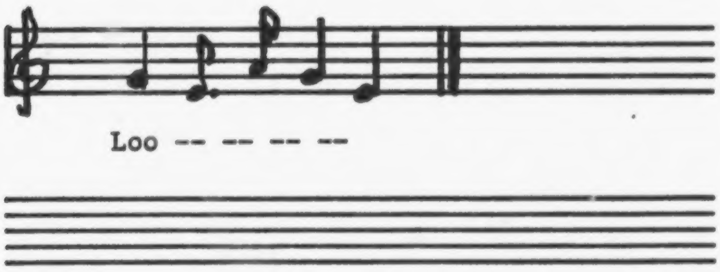
***Making Music Your Own*, Book 2**
Silver Burdett Company

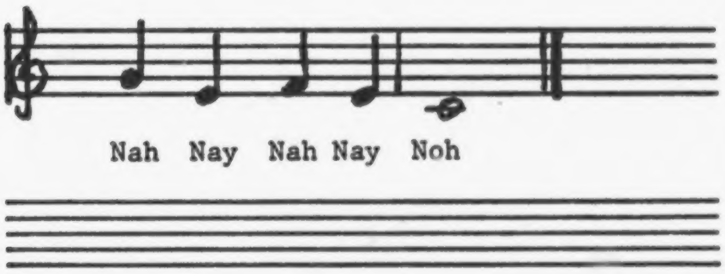
Elephant Song	page 28
Old House	page 24

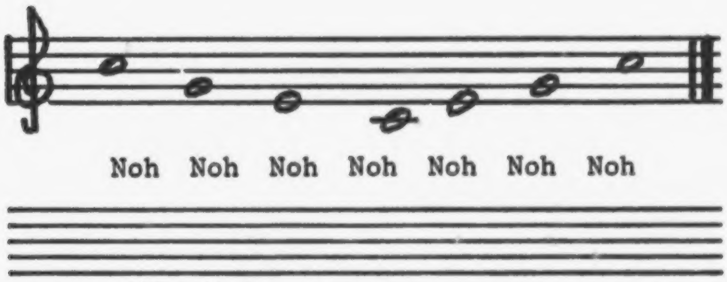
7. Vocalises Used in the Cleveland, Ohio Case Studies:








Nah Nay Nah Nay Noh


Noh Noh Noh Noh Noh Noh Noh

USE IN ALL KEYS UP BY HALF STEPS

8. Musical dramatizations for choric speaking and practice with song patterns:

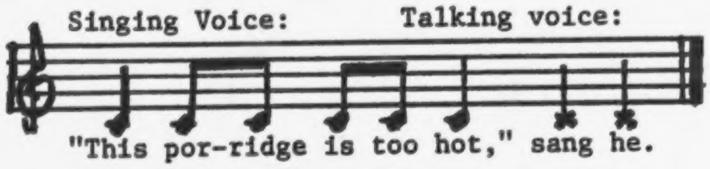
THE THREE SINGING BEARS

Music and story by Marjorie Carlson

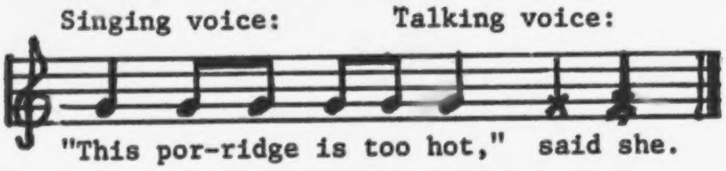
A musical dramatization to help children to find their singing voices

The three Singing Bears lived in the woods,
Just like all good little Bears should.

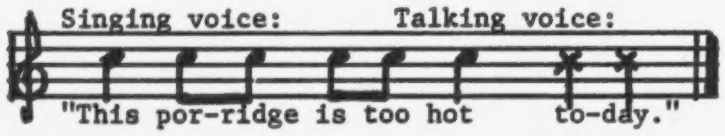
At breakfast the porridge was much too warm,
So Daddy Bear thought 'twould do no harm
To take a little walk.


Singing Voice:
Talking voice:
"This por-ridge is too hot," sang he.

And Mother Bear answered gleefully.


Singing voice:
Talking voice:
"This por-ridge is too hot," said she.

And Little Bear said in his soft cooing way,


Singing voice:
Talking voice:
"This por-ridge is too hot to-day."

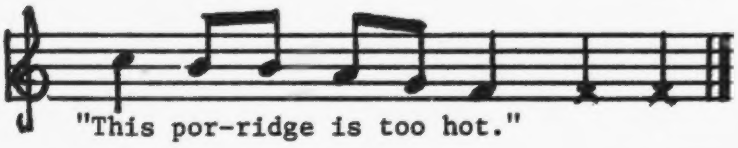
Then off to the cool, cool, woods they went*
To enjoy themselves.
The trees bent low, to whisper, "Hello"
And rustled their leaves to and fro.

(Children, who are not taking character parts, stand and hold arms like branches of trees. The Bears walk under the "trees" and pretend to hide.) (As soon as bears are hidden, children drop arms to side.)

*Use Bears Walking Music

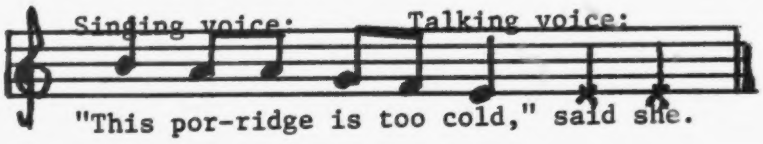
Now Goldi Locks was a skippy Miss*
Who liked to look and look.
She saw the Bears' house
And quick as a mouse
She opened the door of the Three Bears' house.

She went to the kitchen
And sat down to eat
Right out of Father Bear's dish.

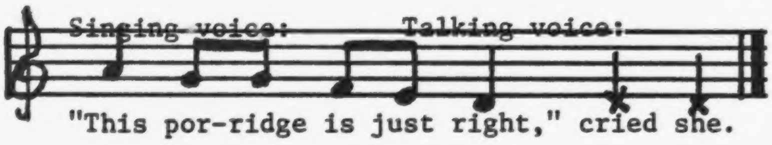

"This por-ridge is too hot."

Sang she.
As she danced away with glee.

Then swish, swish, swish,
To Mother Bear's dish.
She tasted that porridge
OH, MY! It was HORRID.


~~Singing voice:~~
~~Talking voice:~~
"This por-ridge is too cold," said she.

Then on to Little Bear's dish.
She spied it, she tried it,
And sat down beside it.


~~Singing voice:~~
~~Talking voice:~~
"This por-ridge is just right," cried she.

"This por-ridge is just right," cried she

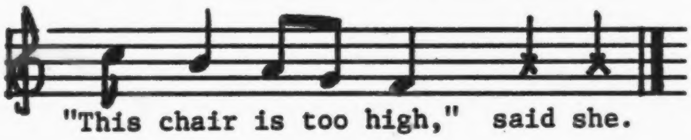
SHE ATE UP THE PORRIDGE. THAT WASN'T NICE.
She should be more polite.

*Use Goldi Locks music.

She danced around and around and around,
Until the living room she finally found.

Look! Over there!
The Three Bears' chairs.

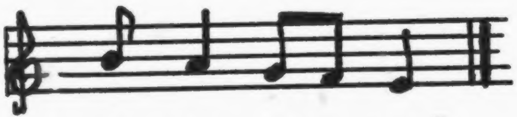
Miss Goldi sat down in Daddy Bear's chair.


"This chair is too high," said she.

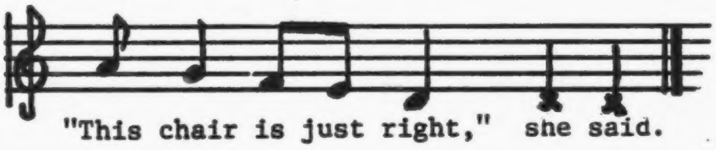
Oh My! Oh My!
This chair is too high.

Mother Bear's chair looked so inviting.
It looked just right for sitting and writing.

But NO! NO! NO!

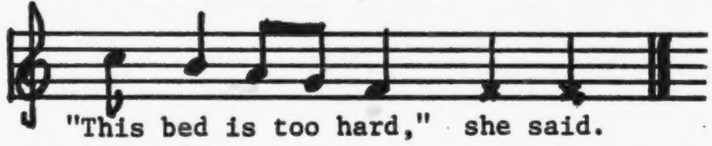

"This chair is too low."

She must find a place to comb her hair.
Baby Bear's chair
Right over there.
It's cozy, it's rosy, it's all full of posies.


"This chair is just right," she said.

So she sat and sat
And combed her hair.
She sat the bottom
Right out of that chair.

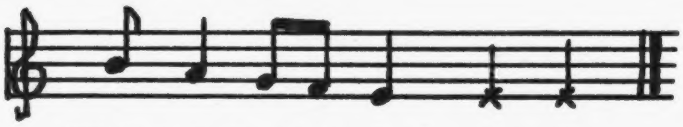
Now where will Miss Goldi go next?
I suspect
She's bound for the bedroom.
Just what I supposed
She's bouncing on Daddy Bear's bed on her toes.



"This bed is too hard," she said.

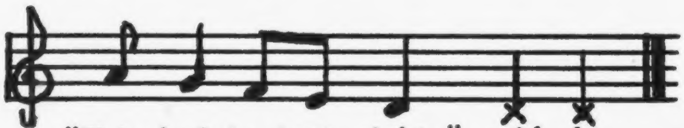
Now right over there is Mother Bear's bed.
It looks soft and fluffily fluffy.
So puffily puffily puffy.

"I'll lay down my head
Right onto the spread
And then straighten it up
In a juffily."



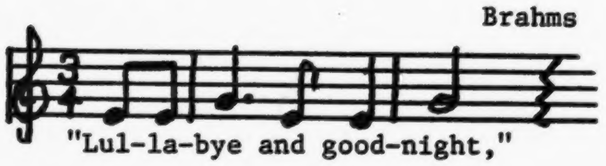
"This bed is too soft," sang she.

Then she looked around
WHEE-E-E-E-E
Baby Bear's bed.
She'd try it,
And if she liked it,
She might lie upon it.



"This bed is just right," said she.

Brahms

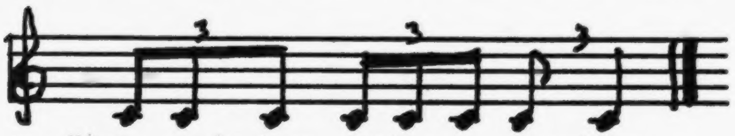

"Lul-la-bye and good-night,"

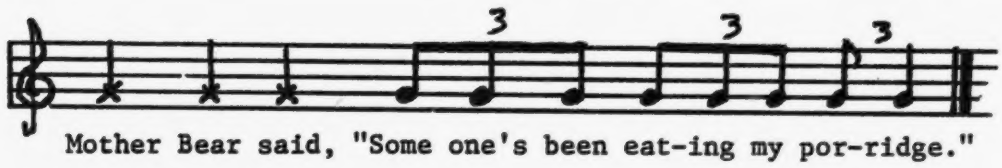
Sang the birds in the tree.
And sweet Goldi Locks
Was soon floating free,
To slumberland dreams

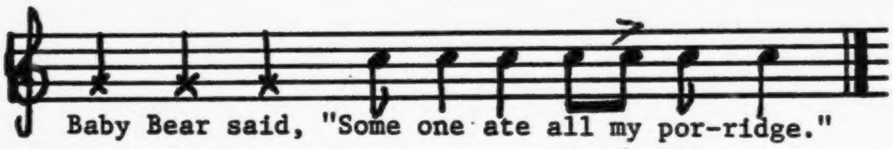
Now time passes by
In the wink of an eye.

There's a thump at the door
And a stamp on the floor
And someone is coming I know.

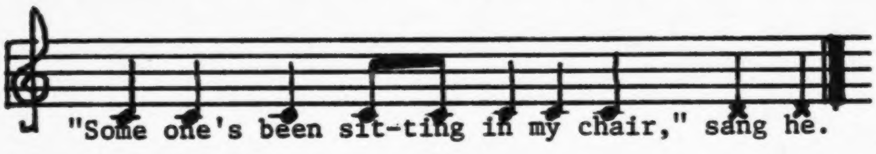
They came in the door
And looked at the table.
And before you could say
Fiddle Dee Fabla
Daddy Bear said just as fast as he was able.


3
3
3
"Some one's been eating my por-ridge.

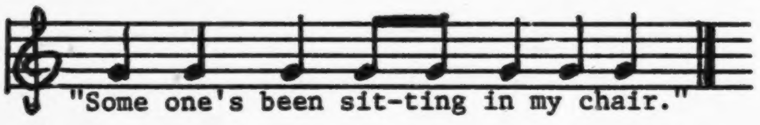

3
3
3
Mother Bear said, "Some one's been eat-ing my por-ridge."


Baby Bear said, "Some one ate all my por-ridge."

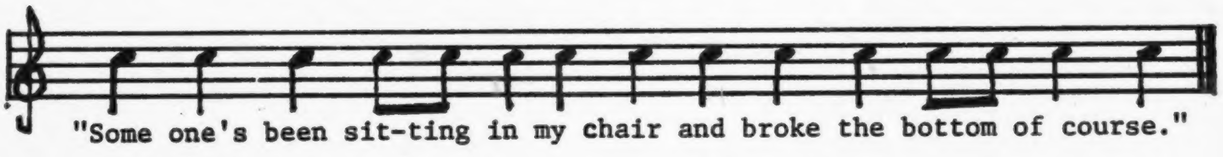
Then Daddy Bear looked
Through the door
And saw Little Bear's chair on the floor.


"Some one's been sit-ting in my chair," sang he.

And Mother Bear shook her head
Sor-row-ful-ly.
And then she said
As loud as she dared.

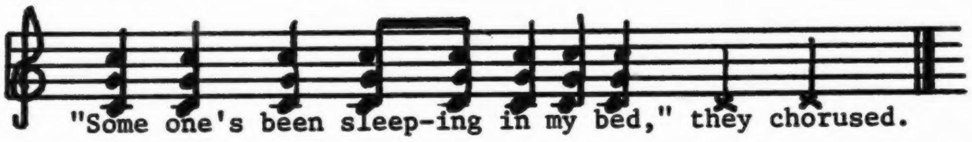

"Some one's been sit-ting in my chair."

And Baby Bear
Just rubbed his eyes
And sang in a sniffily voice.


"Some one's been sit-ting in my chair and broke the bottom of course."

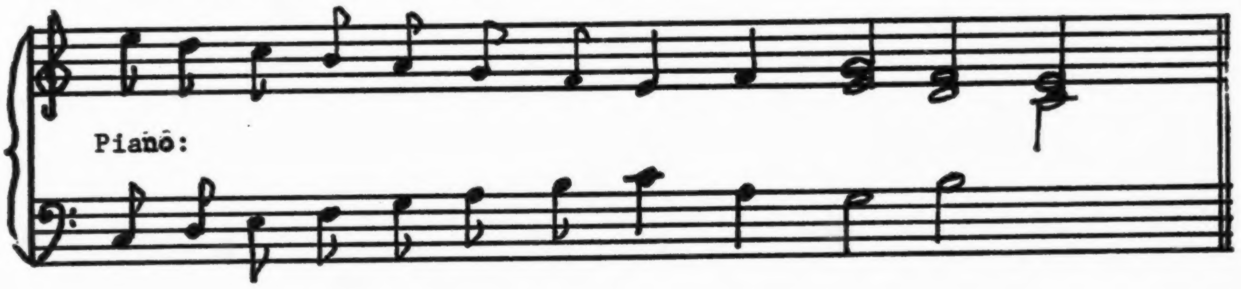
Now Daddy and Mother and Baby Bear
Knew that some one was here in this house.

They tiptoed to the bedroom
To take a little peak.
And there they saw
Fast asleep
Goldi Locks.


"Some one's been sleep-ing in my bed," they chorused.

Now Goldi Locks woke with a start.
And made a dart for the door.

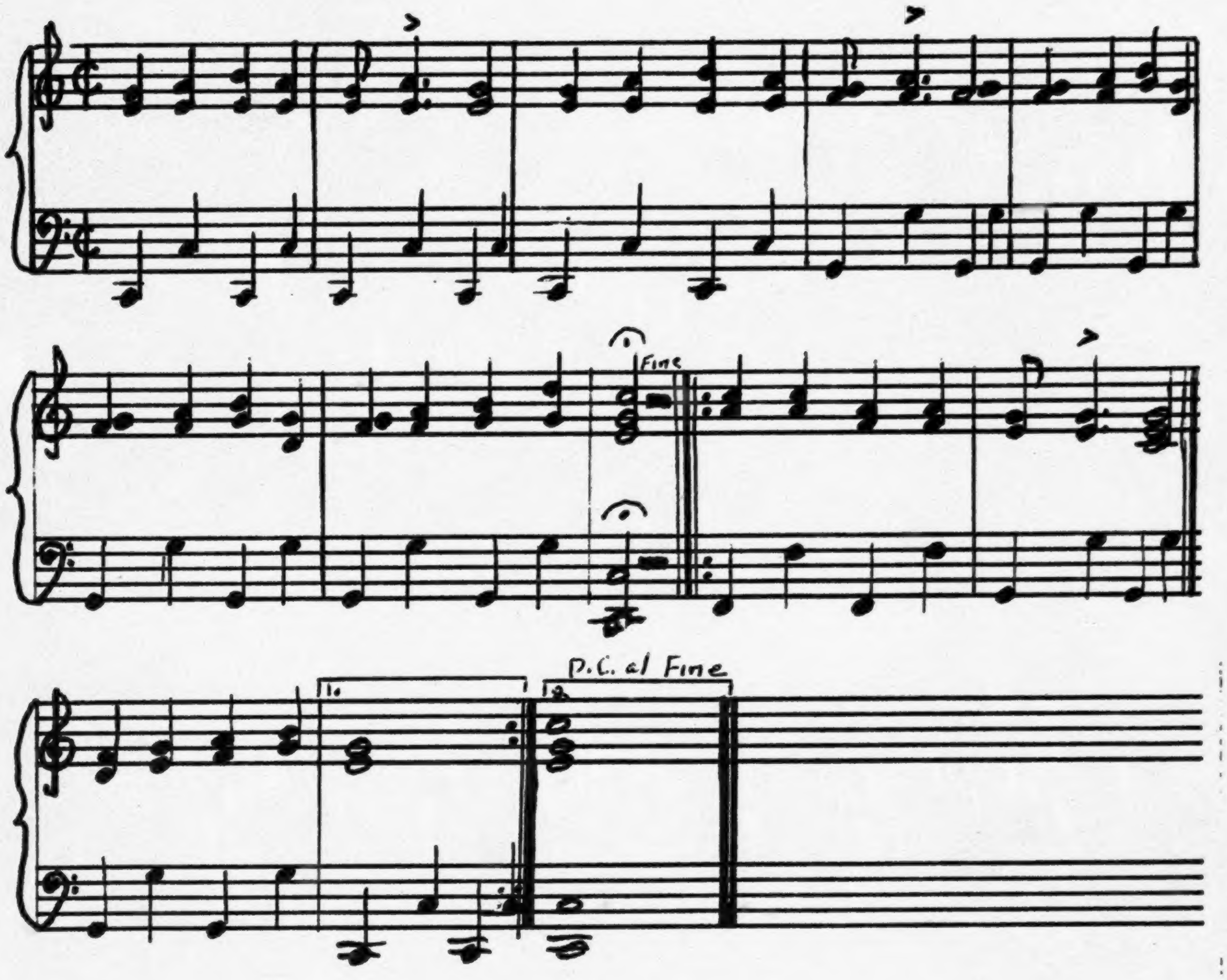
She ran as fast as ever she could.
Right out into the deep, deep, cool woods.



She never stopped until she was home.
And I know that she will never roam
To the Three Bears' house again.

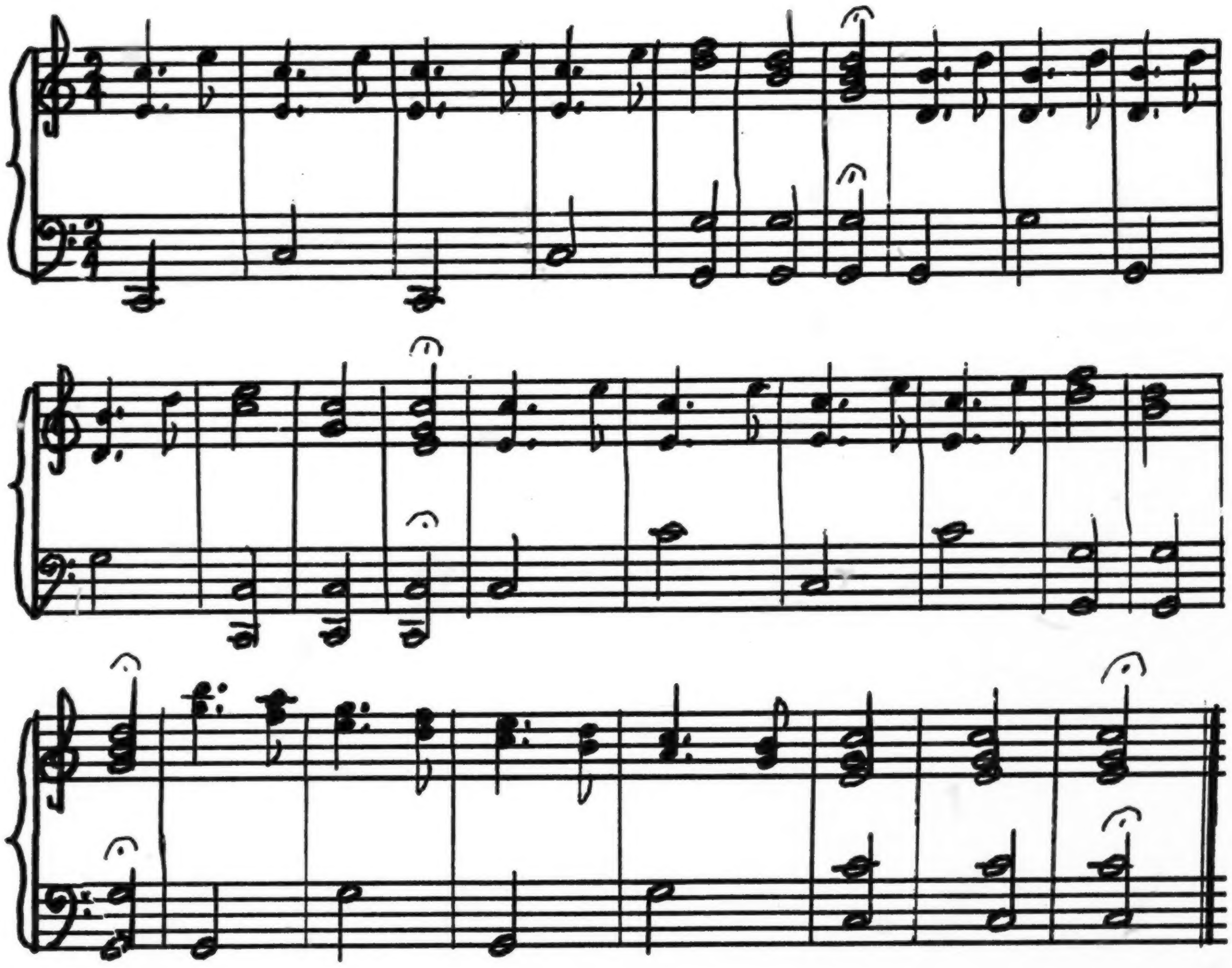
BEAR'S WALKING MUSIC

Swinging - Loose Shoulder Walk M. Carlson


Fine
D.C. al Fine
1.
2.

GOLDI LOCKS MUSIC

Quick Step - Light and Lilting M. Carlson

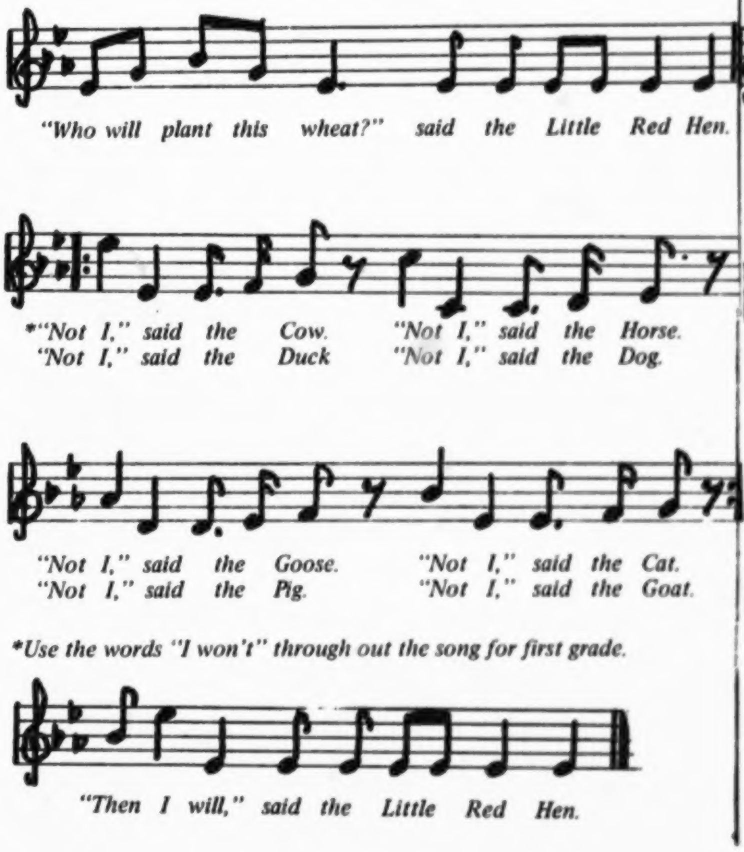


THE LITTLE RED HEN
by Marjorie Carlson

In the big barnyard, lived a little Red Hen,
And all her little Chickens, Eight, Nine and Ten.

Now Mrs. Hen was a busy one
And a grain of wheat, She soon uncovered.

She called to her friends in the old barnyard,
And told them the secret
Of the wheat she had discovered.

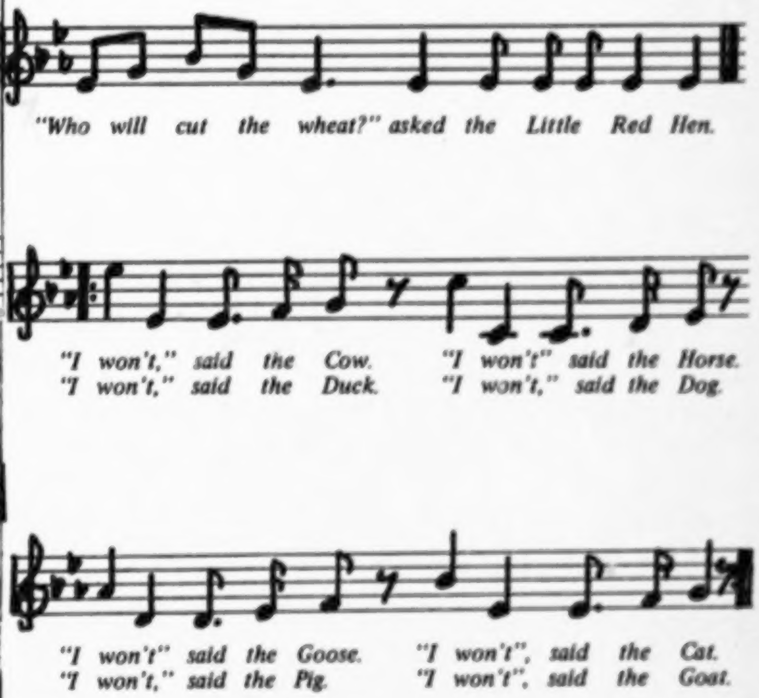

"Who will plant this wheat?" said the Little Red Hen.
*"Not I," said the Cow. "Not I," said the Horse.
"Not I," said the Duck "Not I," said the Dog.
"Not I," said the Goose. "Not I," said the Cat.
"Not I," said the Pig. "Not I," said the Goat.
"Then I will," said the Little Red Hen.

*Use the words "I won't" through out the song for first grade.

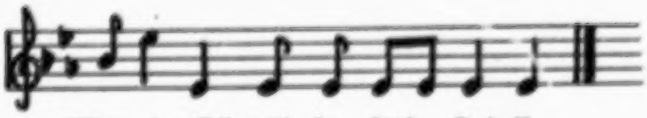
And she did just as she said.*
She planted the wheat, and then she went to bed.

The very next day she 'woke with a start.
And found that the sun was shining bright.

The days went by, and the sun shone,
And soon she had a big stalk of wheat all her own.


"Who will cut the wheat?" asked the Little Red Hen.
"I won't," said the Cow. "I won't" said the Horse.
"I won't," said the Duck. "I won't," said the Dog.
"I won't" said the Goose. "I won't", said the Cat.
"I won't," said the Pig. "I won't", said the Goat.

*Use Planting Song.



"Then I will," said the Little Red Hen.

So she cut the wheat,* and then she thought.
I wonder if my friends will help???

Same melody as before.

"Who will go to market?" asked the Little Red Hen

Same.

"I can't," said the Cow.
"I can't," said the Duck.
"I can't," said the Horse.
"I can't," said the Dog.

Same.

"I can't," said the Goose.
"I can't," said the Pig.
"I can't," said the Cat.
"I can't," said the Goat.

Same.

"Then I will," said the Little Red Hen

**Use Cutting Song here.*

Off to the market,* she took the wheat,
And when it was ground she started home again.

She had to hurry home and fix some dinner,
She knew some hungry chicks who needed some meal.

And when she got home, she went to the barnyard,
And of her friends once more she inquired.

Same.

"Who will mix the meal?" asked the Little Red Hen.

Same.

"Not me," said the Cow.
"Not me," said the Duck.
"Not me," said the Horse.
"Not me," said the Dog.

Same.

"Not me," said the Goose.
"Not me," said the Pig.
"Not me," said the Cat.
"Not me," said the Goat.

Same.

"Then I will," said the Little Red Hen.

**Use Market Song.*

So she mixed the meal*, then she went to bed,
She was very, very tired and she had an achey head.

But the very next day, she called to her friends,
And slyly she asked in her softest voice.

Same.

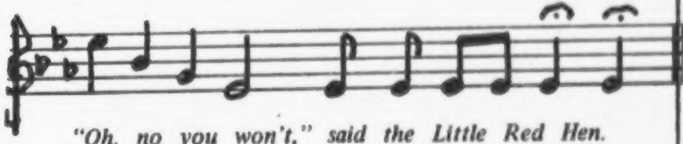
"Who will eat the meal?" asked the Little Red Hen.

Same.

"I will," said the Cow. *"I will," said the Hors*
"I will," said the Duck. *"I will," said the Dog.*

Same

"I will," said the Goose. *"I will," said the Cat.*
"I will," said the Pig. *"I will," said the Goa*



"Oh, no you won't," said the Little Red Hen.

Use Mixing Song.

She called her chickens, Eight, Nine, and Ten.
And they all sat down to a great big dinner.

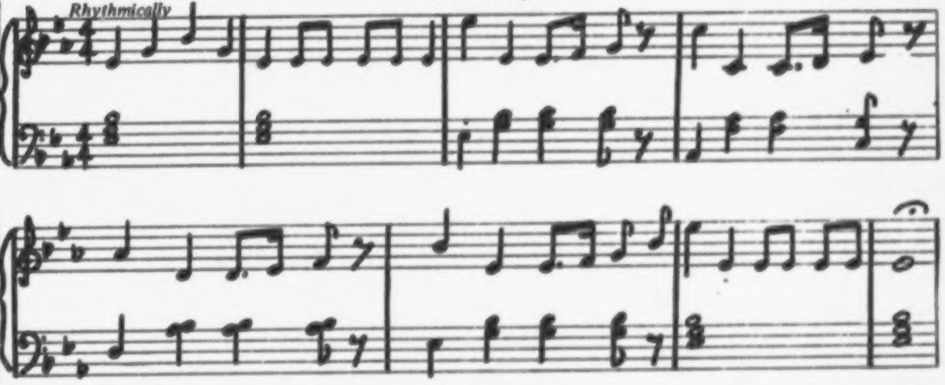
Her friends in the barnyard sat and watched,
As the Little Red Hen and her chickens
Enjoyed that meal.

How they wished they had been good,
So that they might have had some meal.*

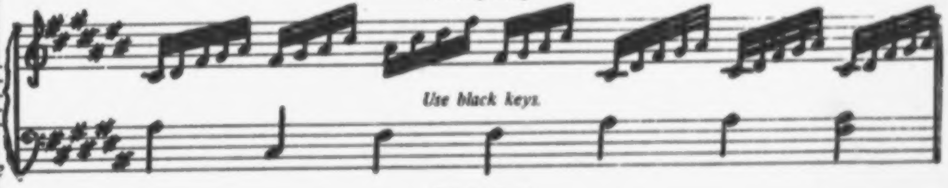
Now you see it pays to do the right thing,
and be kind and helpful to each other.

*Use Bo͞o Ho͞o Song.

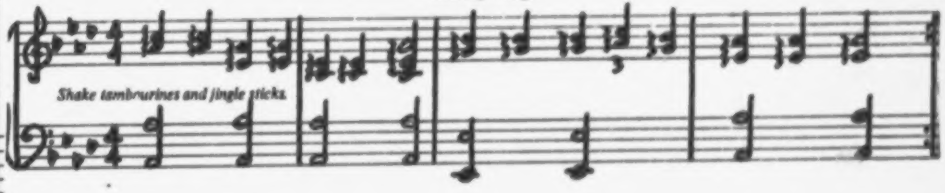
Animal Song



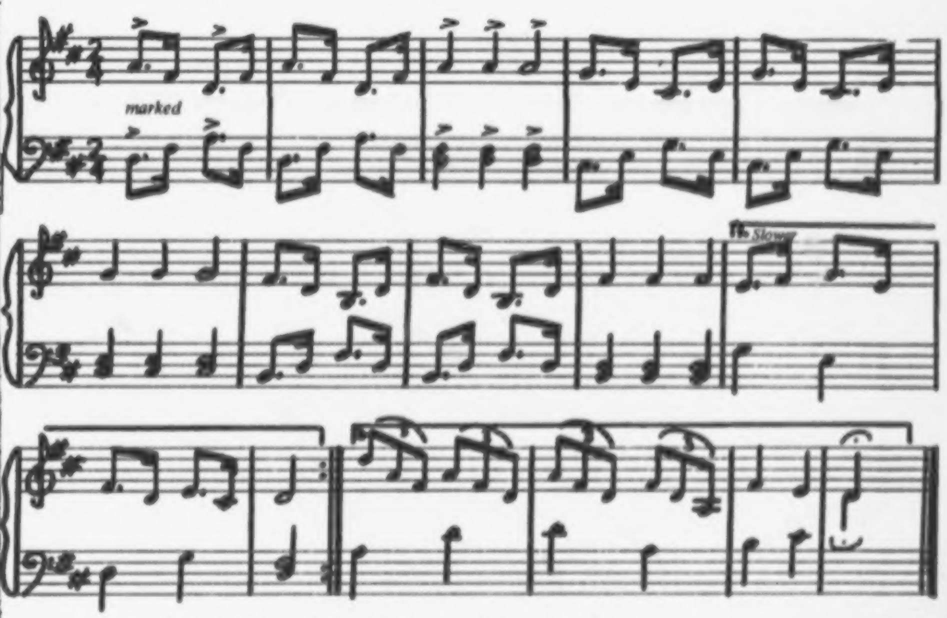
Planting Song



Cutting Song

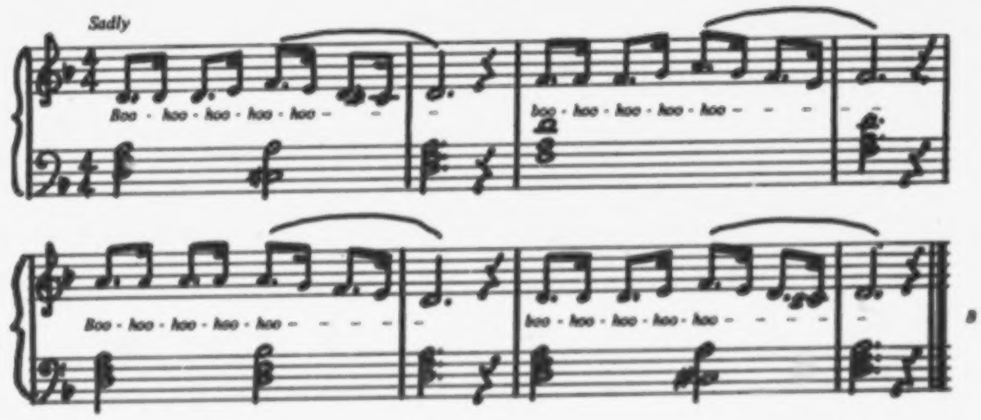


To Market Song

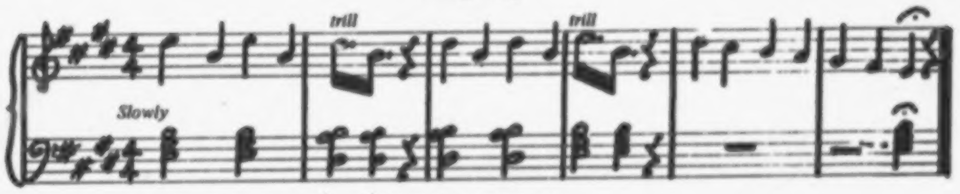


Use sand blocks and cymbols against each other for grinding sound.

Bōō Hōō Song


Sadly
Boo - hoo - hoo - hoo - hoo
boo - hoo - hoo - hoo - hoo
Boo - hoo - hoo - hoo - hoo
boo - hoo - hoo - hoo - hoo

Mixing Song


trill
trill
Slowly

EXPLANATION

These dramatizations can be used in different ways.

1. They can be used as stories.

2. The music may be used to develop pitch sense for young children.

3. The stories may be used as dramatizations for programs or schoolroom activities.

4. Rhythm instruments may be used to help children develop rhythm.

    a. Drums may be used for bear's walking music.
    b. Triangles or jingle bells can play rhythm of Goldi Locks Music.
    c. Pitches for the singing parts can be played on resonator bells.
    d. A glissando on the piano or on the resonator bells will emphasize the eating of Little Bear's porridge.
    e. Cymbols may be struck or a loud low chord can be played on the piano to make the sound of the breaking chair.
    f. Goldi Locks' haste to reach home can be emphasized by shaking the tambourines.
    g. Use other creative ideas.

Marjorie Carlson